PENNSYLVANIA GAME NEWS

JUNE, 1961

TEN CENTS

Erie Public Library
Erie, Pa.

THE STORY BEHIND THE COVER

WHY does a pheasant cross the road? Unlike the proverbial chicken, a ringnecked pheasant doesn't risk life and limb just to get to the other side. Rather, this popular and easily recognized game bird is just doing what comes naturally.

Unfortunately, pheasants have never quite adjusted to mechanical living. Their instincts and reflexes work admirably well during hunting seasons but during the rest of the year they apparently don't recognize or react quickly enough to the dangers of high-speed driving. Thousands of ringnecks lying dead along or on the macadam and cement each spring and summer bear mute testimony to this gory fact. They can, and often do, fly high enough to pass over the traffic. But all too often, they run, stop or fly low enough to wind up in a mess of broken bones and scattered feathers.

The hen ringneck and her brood walking slowly and calmly across the rural road on this month's front cover may or may not make it. The factors that spell the difference between life or death involve the speed of the automobile, the alertness of the driver, and human judgment. In this example, the driver behind the wheel can, and should, stop until the mother and every chick are safe and sound on one side of the road or the other. Unfortunately, it is not always possible to come to a complete standstill on well-traveled highways without risking human life. Another car may be following too closely behind, there may not be time to stop without sending the car into a dangerous skid, or the birds may suddenly fly into the path of cars and trucks. In such instances, all you can do is to hope that the end came quickly and without suffering.

Too many times, however, human carelessness or indifference have doomed wildlife on the highways which should have lived for another day. Some sadists have even been observed stepping on the gas or deliberately swerving their cars to kill pheasants and other game crossing highways. If the human being can claim any mentality or reasoning power above all the other forms of life on this planet, then there is no possible excuse for such action.

This year, and especially during this nesting and brooding season, keep your eyes on the road ahead when you are driving anywhere in Pennsylvania. And if you can possibly slow down or stop in order to give wild birds and animals a chance to safely cross your path, do so. The life you save may not be your own—but it will be a life that can add much to your enjoyment, sport and pleasure.

PENNSYLVANIA
GAME NEWS

Volume 32 • Number 6

JUNE, 1961

Published Monthly by the
PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA

David L. Lawrence
Governor

COMMISSION MEMBERS

James A. Thompson, President
Pittsburgh

H. L. Buchanan, Vice-President
Franklin

Dewey H. Miller, Secretary
Bedford

Brig. Gen. Nicholas Biddle
Bethayres

Andrew C. Long
Shamokin

C. Elwood Huffman
Marshalls Creek

Russell M. Lucas
Philipsburg

Carroll F. Hockersmith
Shippensburg

★

M. J. Golden
Executive Director

★

PENNSYLVANIA GAME NEWS

Willard T. Johns, Jr.
Editor

Mrs. Zelda Ross
Circulation

IN THIS ISSUE

Page

Somewhere Along the Trail 5
By Paul A. Matthews

A Credit to Conservation 9
By Howard Bullock

Woodchucks Around the Year 15
By Dr. David E. Davis

Whose Nest Is That? 18
By Ned Smith

Winter Feeding—1961 24
By C. C. Freeburn

Field Notes 27

Productive Sands Under State Game Lands 32
By John B. Sedam

Principles of Game Management—Game and Habitat Analysis 36
By John Madson and Ed Kozicky

Eating Like a Bird 39
By Dr. Leon A. Hausman

Glad Hand From Glatfelter 43
By Robert G. Miller

Conservation News 47

Glassware for Sportsmen 52
By Jim Varner

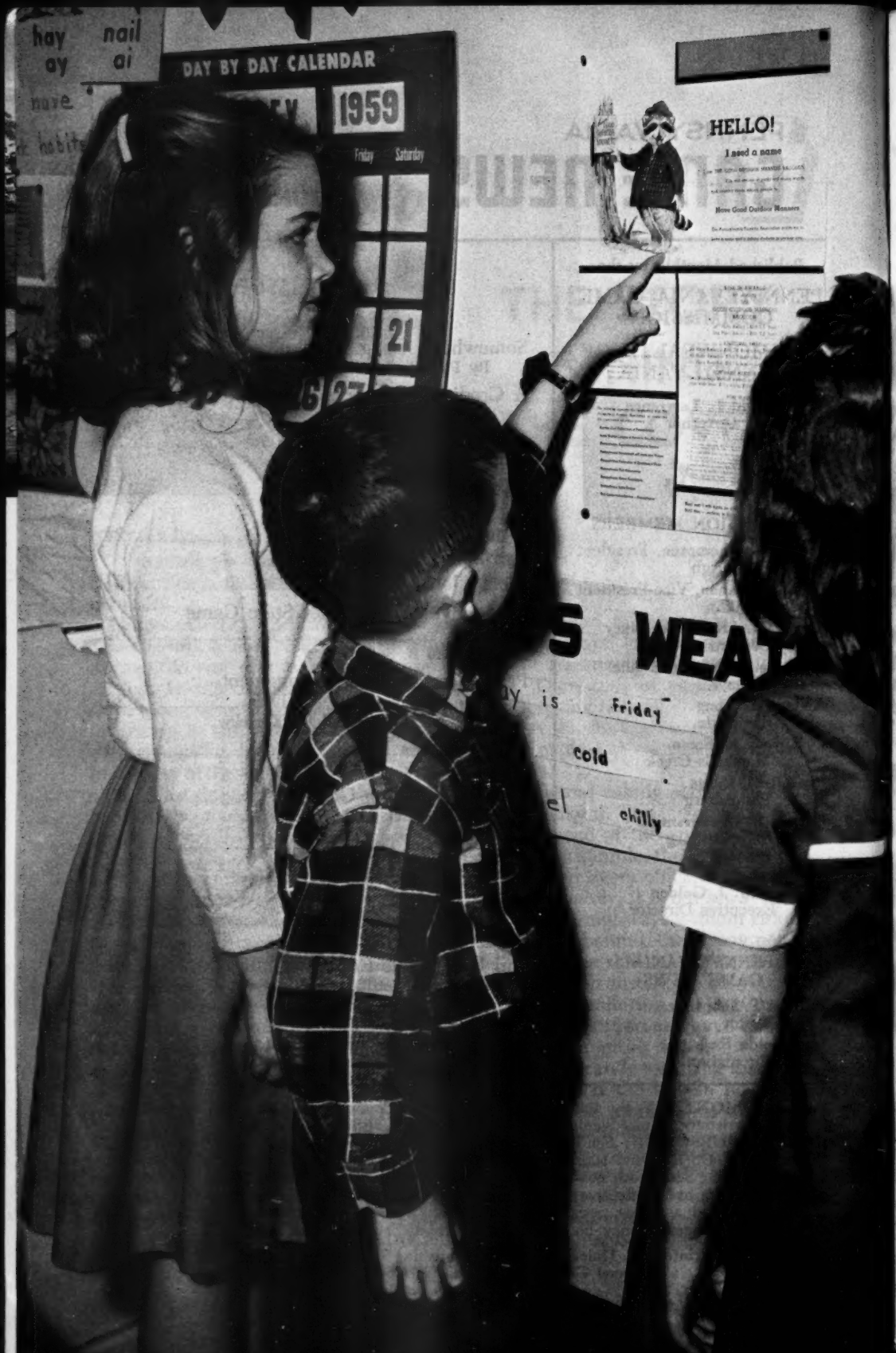
Tackle Dividends 57
By Tom Forbes

Soil Plus Plants Equals Wildlife 61
By Ted S. Pettit

Cover Painting By
Ned Smith

Published MONTHLY by the Pennsylvania Game Commission, South Office Building, Capitol, Harrisburg, Pennsylvania. SUBSCRIPTION RATES: $1.00 per year; $2.50 for three years. TO SUBSCRIBE: Send checks or money order payable to "Pennsylvania Game Commission." Do not send stamps; cash forwarded is done so at sender's risk. CHANGE OF ADDRESS: Send both new and old addresses at least 45 days in advance of the issue with which it is to be effective. PERMISSION TO REPRINT any signed article may be granted provided advance permission is obtained from the author. No information contained in the magazine may be used for advertising or commercial purposes.

Printed by Times and News Publishing Co., Gettysburg, Pa.
Second Class Postage Paid at Gettysburg, Pa.


hay
ay
nail
ai
DAY BY DAY CALENDAR
1959
Friday
Saturday
21
HELLO!
I need a name
Have Good Outdoor Manners
Friday
cold
chilly

75 Years of Service
In Keeping Pennsylvania...

Greener, Cleaner, Healthier and Wealthier

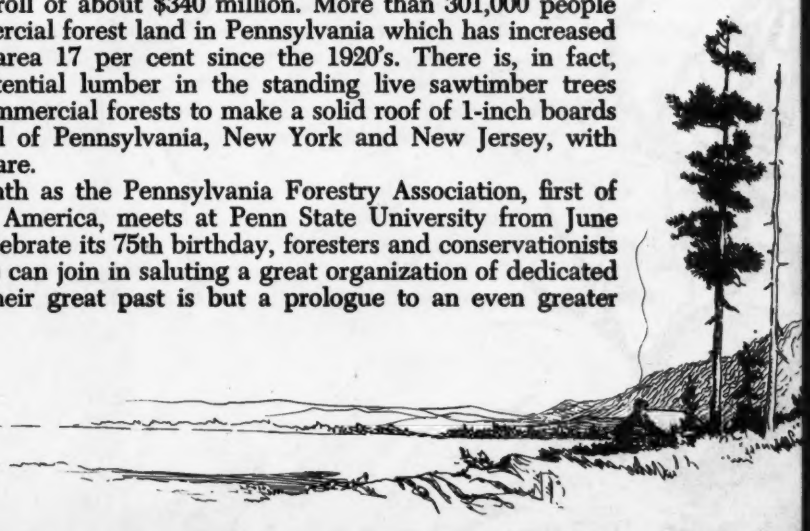
THIS year marks the Diamond Anniversary of the oldest citizens' conservation organization in Pennsylvania—the Pennsylvania Forestry Association. Founded in 1886, this Association has made notable contributions during a vital period of America's growth. Through the united efforts of many dedicated citizens, it has promoted tree farms, organization of voluntary local watershed associations, a coordinated resource development program for Pennsylvania, multiple-use of forest lands, and for the past several years has conducted the highly successful educational campaign centered around "Howdy," the Good Outdoor Manners raccoon.

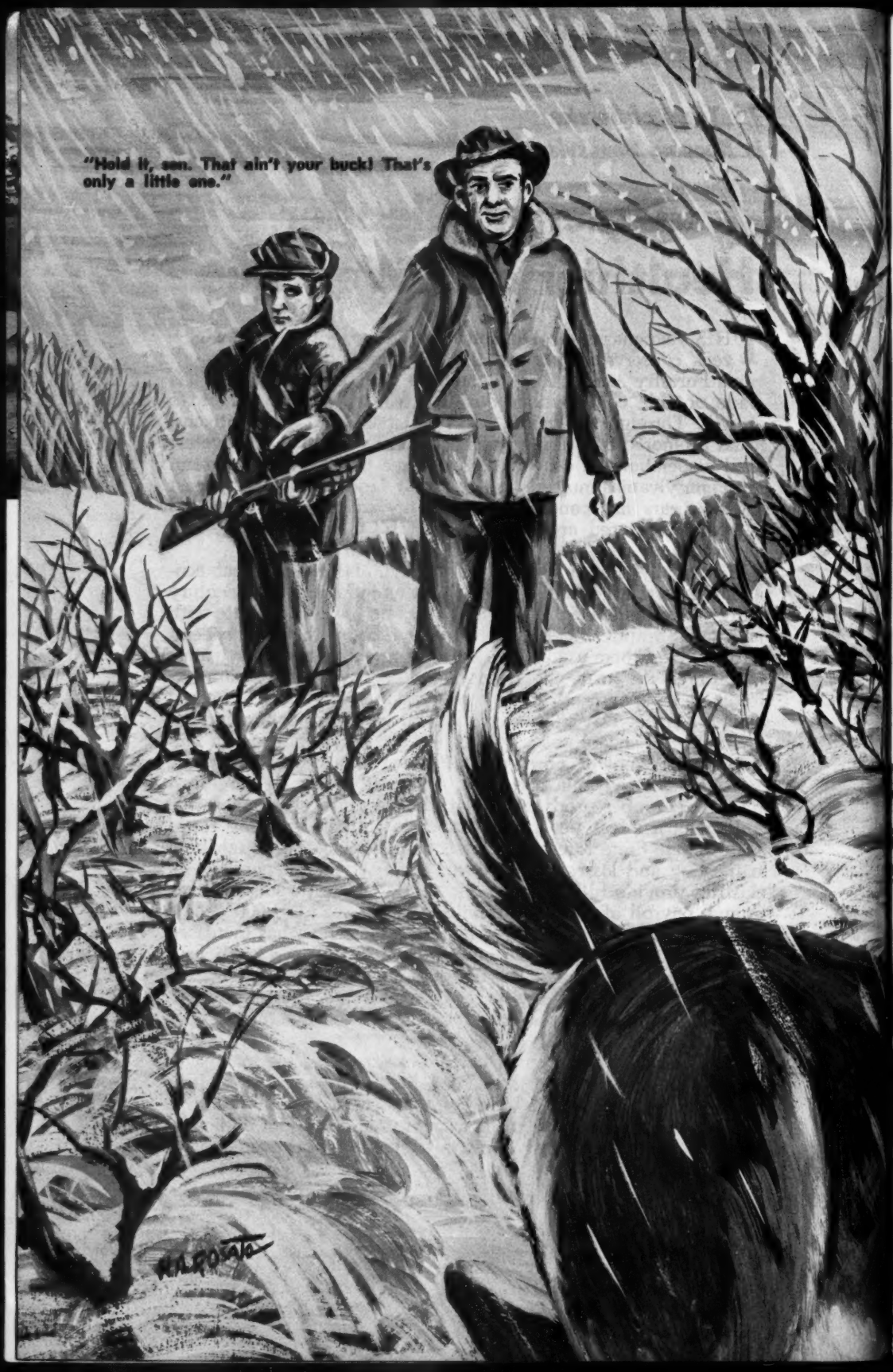
Historically, Penn's Woods has brought fame and great economic growth to the people of this Commonwealth. A century ago Pennsylvania led the nation as a lumber-producing state with an annual output of 2 billion board feet. More than 100 species of trees, 41 of them used commercially, are native to Pennsylvania.

Through the years the Pennsylvania Forestry Association has initiated or sponsored many conservation milestones. It helped establish Arbor Day in 1886. It started forestry education and the creation of a school at Mont Alto in 1903 which has grown into the great School of Forestry at Pennsylvania State University.

Today Pennsylvania can again look with pride to her forest industry. Lumber production is on the rise, now standing at 560 million board feet per year. Timber is actually growing faster in Keystone State forests than it is being removed through both harvesting and losses from natural causes. Forest-dependent industries provide full-time jobs for nearly 82,000 persons with an annual payroll of about $340 million. More than 301,000 people own commercial forest land in Pennsylvania which has increased her forest area 17 per cent since the 1920's. There is, in fact, enough potential lumber in the standing live sawtimber trees of these commercial forests to make a solid roof of 1-inch boards covering all of Pennsylvania, New York and New Jersey, with some to spare.

This month as the Pennsylvania Forestry Association, first of its kind in America, meets at Penn State University from June 13-15 to celebrate its 75th birthday, foresters and conservationists everywhere can join in saluting a great organization of dedicated citizens. Their great past is but a prologue to an even greater future.




"Hold it, son. That ain't your buck! That's only a little one."

The Man You Leave Behind Is
The Greatest Mark of Your Passing...

Somewhere Along the Trail

By Paul A. Matthews

THE Old Man sat in the rocker by the window where he could look down into the valley. Already, the long purple shadows of evening probed at the brittle-crusted snow—weird, abstract intangibles flowing with a bitterness of heavy, dark malt syrup until they consumed the whole of the landscape and left an eerie glow of smouldering frost.

One by one he counted the lights as they blinked on in the valley, lights that to him meant human warmth and the life of youth. They were spontaneous—electric. Not the gradual increase from the flicker of a sulphur-tipped match to the smoky yellow glow emitted from the single kerosene lamp at his elbow.

He sighed wearily and hobbled across the room where the coffee pot simmered and rocked with heat on the back of the Glenwood range, sending out a wavering ribbon of steam that permeated the atmosphere with a distinctive odor. Supper (for in those days it was supper and not dinner) was as simple as that and the warmed-over squirrel that Jim had left yesterday.

Now there's a good lad, he thought. A lad that's felt the early morning frost and the November rain-swept fields since he was knee high to a droopy eared hound better remembered as Duke. And that was quite a spell back, too. Duke had been gone for years, and even the apple tree

planted over him was now a mass of architectural meanderings silhouetted against the cold skyline on the ridge behind the kitchen.

The Old Man touched the steaming mug to his lips, sipping just enough of the hot fluid to stimulate his circulatory system and fill the transparency of his veins with renewed vigor. He pulled the meat from the squirrel, chewing it between barren gums, mindful of the fact that there wouldn't be any number 4's or 6's to lacerate his jaws. He had taught Jim years ago that a squirrel ought to be shot through the head—and with a rifle!

As the Old Man quietly ate his supper, the frozen silence of the night—pricked by myriads of diamond-pointed stars and swathed in a funereal cloak of reflected moonlight—closed in around the house. And as on hundreds of other similar nights, he sipped at the mug as though to wash away the dust from memories of events long past.

It wasn't difficult to visualize a cold February night thirty years ago—the night when he carried Duke home in the snug depths of his mackinaw pocket. That was when Jim was young and the house was warm with life like those he watched in the valley below. The lad was six years old then, a misty eyed kid cutting valentines from scraps of flowered wallpaper scattered about the kitchen table.

On that long ago February night, when the Old Man put the pup on the table in front of Jim, it was like mixing a fine-grade mortar. The pup, with its distinctive odor of newness, was a portion of the bonding ingredient and later, as the lad grew, the Old Man added the experience and knowledge of the outdoors that was the vehicle of the mixture.

"Is he ours, Dad?"

"He's ours, Jim. Shake on it." And under the wavering oval shadows cast by the kerosene lamp, Jim and the Old Man formed a partnership.

The days slid by — one dissolving into the next — and each of them marked by its own particular discussion as to whether a tablespoonful of cod liver oil should be added to the dog's diet, or as to whether it was fitting and proper that a hound dog sleep on the foot of the bed. And in the making of this momentous decision, the Old Man employed a tactful speech of eloquence—second only to Portia's mercy speech — when he approached Mom on the subject of such delicacy.

To say that Duke wakened the family in the middle of the night to save them from the perils of an overheated stove would be a trite reminder of such tales as Black Beauty and Beautiful Joe, for Duke certainly was not that kind of a dog. He was a hunting dog—heart, body and soul. And like the boy, he lived from one day to the next anticipating each embracement of the outdoors in the company of the Old Man. For to the Old Man, the outdoors was not something to be merely enjoyed—it was an institution to be lived—a galaxy of universes compounded of trees, rocks, plants, bugs, beetles, reptiles, birds, animals, and the weather. To the Old Man, even a stalk of timothy was vitally important to the slowly grinding mills of nature.

He still remembered, over that vast ocean of years, the day that the three of them paused beside a clod of swamp grass with its single blade of timothy standing upright—towering high above the other grasses. And how a long, black train of small ants, clinging to one another, braved its heights to bend it over the small stream that obstructed their path.

"You see, Jim," the Old Man had said, "years before man ever thought of such a thing as a bridge, these small creatures were building them—a tiny ant no bigger than a clipping from your finger nail!"

And thus it was. The Old Man could read the weather of years past by the thickness of growth rings on a fresh-cut stump, or he could go back

into times unknown when the masses of fossils at the lime kiln were living flesh and shell in a mud-bottomed ocean. His boundless knowledge was mysterious, yet simple, and to the boy, it was the very breath of life.

The recollection of a long-ago November struggled into view with the uncertainty of a weak television tube, faded away and then returned with sharp clarity. The brassy chatter of the old three-legged alarm clock had shattered the night stillness like a fine, crystal goblet, and had ushered in the opening day of small game season. The Old Man remembered fumbling his way to the kitchen where he finally struck a light to the kerosene dampened wick, and as the soft yellow glow searched out the far corners of the room, he saw Jim, sitting at the table with his arms folded and his face drawn with sleep. The lad had been dressed and ready to go for hours. And even Duke lay under the gun rack with one eyelid open waiting for the word of confirmation.

Those early seasons, the Old Man had said, were the "elementary years" — the years when a boy was best taught the fundamentals of hunting, if not life itself. Yes—it went further than hunting. Give a lad five or six years in the field with the right kind of training, and you can't help but establish a few sound principles in his character that'll stick by for a lifetime! Like the time the kid paunched a ten-pointer up on Thorn Apple Ridge.

The recollection of the event flowed into his mind with the smoothness of maple syrup. He remembered vividly the location of Thorn Apple Ridge—a craggy outcropping of rock to the north of Mallory Run where the soil was too poor to support anything other than stunted thorn apples, and these twisted and bent and aged by the bitter blasts of winter and the blistering heat of summer. He felt the wind as it had been that long ago December morning—twisting with anger and loaded with buckshot-grits of snow that stung their faces and brought tears to their eyes. And then all at once, there was the buck, standing maybe forty yards away looking at them through the snow devils as though it wasn't quite trusting of its own vision.

"It's a buck, Pa!"

"Hesh boy. Take 'im!"

Even as he raised the rifle, the lad eased the hammer back, and as soon as the patch of grayish-brown showed in the buckhorn sight, he touched the trigger and the old Colt Lightning 44/40 came to life. The "thunk" of the bullet—like hitting a ripe pumpkin with a wooden mallet—was all but lost on the wind, and before he could work the action for a second shot, the buck had wheeled and was gone.

"I hit 'im, Pa! I heard it!"

"Yep. You hit 'im, Jim. But we ain't got 'im yet."

That was ten o'clock in the morning, and at four in the afternoon of the same day, they still hadn't finished off the buck though they had trailed him the length of Mallory Run, across the southern ridge into Goose Hollow, and nearly the full length of that valley. And now his tracks led across an open slope toward Dead Man's Swamp where a man could stand five feet from a deer and not be the wiser.

Darkness came early in the winter, prompted even faster by the gloom of falling snow, and though it was against the Old Man's better judgment to follow the tracks directly across an open field, time was of an essence and they pushed ahead.

"We goin' to lose 'im, Pa?"

"Not unless we quit," the Old Man replied. And he quickened his pace to a half dog-trot that made his legs ache.

Three-quarters of the way across the slope, there was a movement off to the right, and simultaneously they stopped, the boy raising the rifle ready for a shot at the south end of a forked-horn buck that had bounced up from a bed in the goldenrod and timothy.

"Whoop! Hold it, son. Thet ain't yore buck! Thet's only a leetle one."

"He's legal, Pa! I seen his horns!"

But the Old Man pushed the rifle down, and even though the deer was within sight for a good hundred yards, and the lad's soul was flooded with a mixture of intense disappointment and desire, they hurried on across the field and into the swamp beyond where the darkness crept in with incredible swiftness. It was here that the Old Man suddenly stopped, wiped the snow from the trunk of a fallen hemlock, and sat down to smoke his pipe. There was an impression of a smile on his face—just a slight tugging of the wrinkles around the corners of his mouth and eyes.

"I coulda killed that forked-horn if you'd let me," the lad said bitterly. "Had 'im right in my sights for a long time."

"What'd you want to kill 'im fer, son?"

The boy looked at his father blankly.

"He followed the Old Man's line of vision and saw the ten-pointer lying dead under a blowdown maybe thirty feet away."

"We're deer huntin', ain't we?"

And then the Old Man chuckled and sucked on the pipe stem till the juice rattled within. "Jim," he said, "all through life, yore goin' to be settin' yore eyes on one goal or another, an' before you reach those goals, yer always goin' to be seein' somethin' else thet'll do, but ain't quite jest what you want. Don't be a quitter, Jim. Put yore eye on one perticular goal an' keep after it till you git there. Don't ever take a second best."

"Yes, but Pa, this is different!"

"No different, son. Thet was a mighty fine buck you crippled this morning, an' even if you didn't owe it to thet deer to track it down, you owe to yourself to keep after it. Now, if you'd shot thet little forked-horn, you'd never have found the big one."

The lad's mouth opened to say something that ended in somewhat of a strangle when he followed the Old Man's line of vision and saw the ten-pointer lying dead under a blowdown maybe thirty feet away.

Yes, that had happened quite a spell back – some twenty-odd years ago. Yet during those few moments in Dead Man's Swamp, the character of the boy had been kneaded like bread dough and leavened with a principle that was to give the character shape and stature for a lifetime to come.

It made the Old Man feel good to think that of all the accomplishments a man can make in a lifetime, it is quite often the rather insignificant deeds—those which are the easiest and simplest to do—that make the most enduring blaze along the side of the trail. A man doesn't have but a few years in life in which to mark his trail, and these pass all too quickly into the realm of Yesterday.

Yet somehow, the Old Man thought, somehow, for those who have left their mark in flesh and blood and character, it's a great feeling; a thrill far beyond that of the hunt itself—a knowledge that humanity has been bettered by our passing.

How Explorer Post Three Won the Hornaday Award...

A Credit to Conservation, Community and Commonwealth

By Howard Bullock

SEVENTEEN-YEAR-OLD John Schlappi was looking down the length of his rifle barrel at a beechnut-fattened, healthy, little "Y-buck." The season was open in Pennsylvania for antlered deer and he had only to disengage the gun's safety, squeeze off the shot and drop the deer in his tracks. But this particular boy carefully lowered his rifle and watched the little buck wander out of sight in the thick hemlocks.

Why? John had bagged a splendid six-pointer the season before and he had decided to pass up all deer until he could collect a better specimen.

Fifteen-year-old Robert Brown sat well concealed in a windfallen tree top while a flock of wild turkeys came feeding in his direction. A red-wattled old tom, his beard dragging the leaves as he fed, stood out from the flock like a lighthouse in the fog—the grandest prize that any Pennsylvania hunter could ever hope to collect. When the birds were well within range, the boy reluctantly shifted his gaze from the old tom, picked out a plump yearling gobbler and bagged it. Like many of his buddies, Bob Brown had been taught that there is great personal satisfaction in knowing that you have

passed up a bird capable of reproducing his kind so that hunting could possibly be even better next season.

Dave McConnell, 16 years old, carefully removed the wet fly from the upper jaw of a brown trout, placed the fish in a pail of water, and swiftly carried the fish to a section of the stream that would offer more protection. Like most of his fishing friends, Dave has learned that it is more fun to release a legally caught fish to be caught another time than to fry it once and forever. He spends much time along trout streams catching trout and releasing them near undercut banks, rock ledges or areas where exposed roots will make it more difficult to take the same trout a second time.

In many sections of the country similar actions by young hunters would be considered highly unusual. But in the neighborhood of Canton, Pa., they are considered par for the course. Here a group of teen-age boys, members of Canton's Explorer Post No. 3, Boy Scouts of America, have made available to any interested boy of the area a wildlife conservation program designed to help develop better sportsmen and improve wildlife habitat.

In October, 1956, the members of this Explorer Post voted to channel their scouting efforts and activities toward the conservation of wildlife—both plant and animal. Situated in a valley surrounded by timber and game lands, generously laced with mountain streams, Canton is an ideal home base for a project of this kind. In the valley, you will find cottontail rabbits, ring-necked pheasants and the usual flatland predators—opossums, gray and red foxes, various hawks and owls and probably the most destructive trio of all, the crow, raccoon and skunk.

Mountains surrounding Canton are covered primarily with hardwood forests, including beech, birch, basswood, maple, ash and oak, with a scattering of hemlock and pine. Here is the home of the whitetail deer, black bear, wild turkey, grouse, varying hare, squirrel, and beaver. The streams of the area at one time produced many brook trout but with a receding water

FATHER-SON TEAMS George Schoonover and George, Jr., along with Marvin Stalker and son, Paul, look over their Safe Hunter badges and certificates following the course sponsored by Canton Explorer Scouts.

NRA HUNTER SAFETY INSTRUCTOR Tony Hoskins, of Towanda, and Game Protector Donald Watson, Wyalusing, check positions of future hunters at indoor range.

table and rising temperatures, the native brookies are now found only in the extreme headwaters of the streams. Downstream, where the water is deeper and more pools occur, you can find brown and rainbow trout introduced by the Fish Commission.

With this abundance of wildlife within walking distance of their homes, the boys are wealthy in year-round project material. They decided to divide their project into four seasonal parts. In the spring they planned to plant seedlings, stock trout for the Fish Commission, and practice forest fire control. Summer would be used for stream improvement work. Autumn would find the boys building game feeders and posting conservation signs prior to the hunting seasons. Winter would bring the most laborious phase of the program—winter game feeding.

Authorities in various fields of conservation were invited to attend meetings and lecture on their specific phase of wildlife management. The District Fish Warden instructed in the tagging and release of legally caught fish. Game Protectors lectured on the game laws, rearing of game, predator control and winter game feeding methods. Foresters and forest rangers discussed various phases of forest management. The local high school biology teacher was most helpful in all phases of the program. After being briefed on the various facets of conservation the boys were ready for actual field trips to practice the principles that they had learned from the series of lecture sessions.

In the past five years the boys have logged much tree planting time. They are always on hand to help the state fish warden with his trout planting activities and the occasional, unexpected arrival of a tanker truckload of fish from the federal hatchery creates a flurry of activity among the boys.

During the open hunting season the boys visit area hunting camps (most of these camps are abandoned farm sites), and discuss with club members the possibility of planting food producing trees and shrubs on club grounds.

Winter, with hip-deep snow and sub-zero cold, offers the greatest chal-

WINTER FEEDING offered the greatest challenge to Explorer Scouts of Canton. During the past five years they have distributed about 25 tons of corn in parts of a three-county area.

lenge to these boys because it is then that they can make their biggest contribution to the conservation of area game. During the past five winters these boys have distributed an estimated twenty-five tons of corn for the wild turkey and ring-necked pheasant population in parts of a three-county area.

Winter field trips can also be fascinating and educational. The boys would occasionally find a trophy buck lying dead and wasted because some uneducated hunter failed to follow up the mortally wounded deer. They experienced the sickening sight of the mature doe, heavy with fawn, dragged to the ground and partially eaten while still alive by dogs allowed to run by careless, thoughtless, lawless owners. They would find the headless bodies of young wild turkeys in the vicinity of their game feeders and assume from tracks in the snow that mice had gnawed the heads from the birds. It took many field trips and much observation before they learned that this was the killing (Modus Operandi) of the great horned owl.

They have experienced the feeling of disgust that comes with the viewing of a dynamited trout hole, the liming of a stream, the jacklighting of deer and the legally killed although mutilated and worthless carcass of a game bird or animal rendered useless due to sloppy shooting.

The boys have been taught that game is a crop which, like any renewable crop, must be sensibly harvested each year. They have been taught that hunting during open seasons set by the Game Commission is the only sensible way to harvest this crop. They have learned that an over-population of deer, and other game, eventually results in winter starvation, disease and other means taken by nature to balance wildlife numbers with available food and cover.

One recent project developed by these teen-age Explorers was a hunter safety course for all boys of the area. Realizing that they would need adult help with a project such as this, they contacted officers of the Canton Rod and Gun Club. After explaining the problem, they received full cooperation from the sportsmen. A local deputy game protector who is an accredited N.R.A. Hunter Safety Instructor agreed to serve as instructor for the course. The Scouts had estimated that there might be 15 to 20 boys interested

in taking the course. Later it developed that these Scouts would have flunked a "judging merit badge" test. When the registration date for the course rolled around, more than 100 boys and adults appeared to sign up for the training.

This response was a bit bewildering, to say the least. But an appeal to the Bradford County Game Protectors was the answer to the problem. Three of these Commission field officers agreed to serve as "emergency" instructors. The supervising principal of the local schools offered classroom space, the Canton lodge of the Loyal Order of Moose (which sponsors the Explorer Post) donated ammunition for the entire course, and the Canton Rod and Gun Club enlarged their firing range to accommodate the large group of neophyte hunters.

As can be expected in any youth program, some of the original trainees were forced to drop out because of illness, football practice and for various other reasons. But when the course was completed some four weeks later 85 boys (and many fathers) were awarded National Rifle Association certificates of merit and safe hunter badges.

Many programs instituted and administered by teen-age boys start with intense enthusiasm but gradually end up in lethargy. But in the fall of 1959, some three years after the Explorer Post No. 3 conservation program was started, we noted (with pardonable pride) that the opposite was true of this group. As older members of the Post graduated from high school and left the community to work or to serve in the armed forces or to continue their education, new boys immediately joined the group to fill the void. For three years I watched these boys develop from a group of eager, undis-

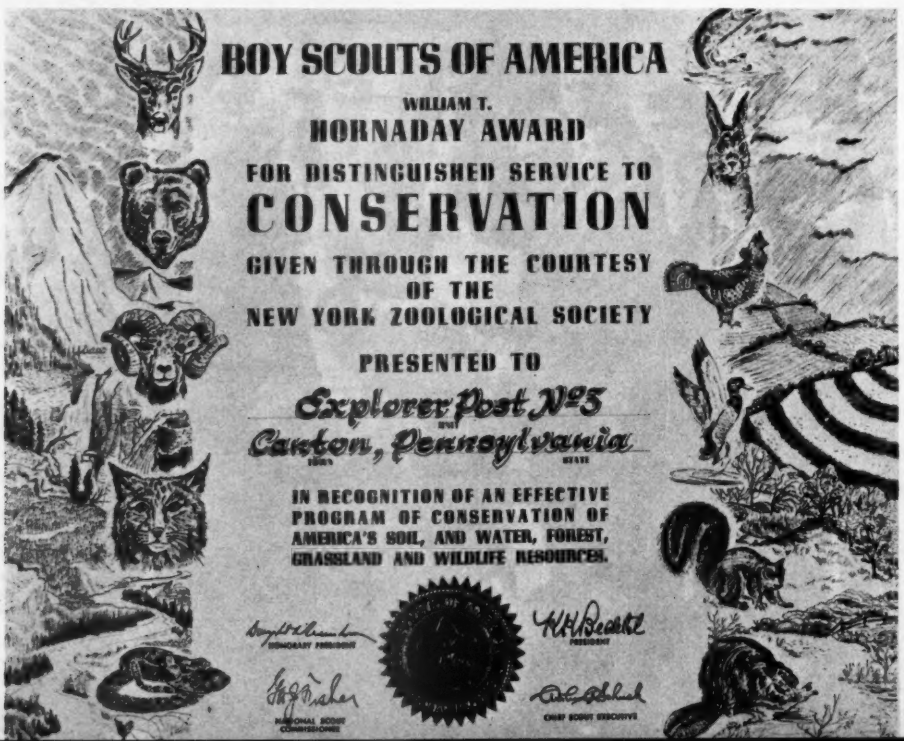
PRESENTATION OF HORNADAY AWARD was made on the first day of National Wildlife Week at ceremonies in Harrisburg. Explorer Post 3 gathered at the Capitol. Greeting them were (first row, left to right): Hon. Evan S. Williams, State Representative from Bradford County; William Most, Post Advisor; George Schoonover, Jr., Post President; M. J. Golden, Executive Director, Game Commission; Howard Bullock, Conservation Advisor; and Jack Tarbux, Post Committeeman.

ciplined young hunters and anglers into a group of fine young men, every one a true sportsman. I watched them plant thousands of trees, stock thousands of fish, carry tons of corn through snows of almost impossible proportions to game feeders they had built. I saw them construct and erect wood duck nesting boxes, clean debris from area streams and build many exhibits urging others to help prevent forest fires and to take an active part in conservation.

The William T. Hornaday Award for outstanding service in the field of conservation is to the outdoor-minded youth what the Congressional Medal of Honor is to the military man. It is given through the courtesy of the New York Zoological Society in recognition of an effective program of conservation in memory of the late William T. Hornaday, a noted pioneer in conservation.

This award is not easily earned. It was necessary for us to spend two years documenting our program with pictures, newspaper clippings, and text material for the formal application. Eventually, however, we had a booklet describing in detail what Explorer Post No. 3 had done. It was submitted to the B.S.A. national headquarters for judging. We held our breaths and waited. And about one month later, and some five years since the start of our conservation program, we were notified that Canton Explorer Post No. 3 had qualified for the Hornaday award.

There was never any question as to how and where the award should be presented. These boys are Pennsylvanians who have been afforded the opportunity of learning some of nature's problems. We received help and full cooperation from all of the Commonwealth's conservation agencies and the logical place for the formal presentation of this award was at the State Capitol. On Monday, March 20, 1961, the first day of National Wildlife Week, we assembled on the steps of the Main Capitol Building in Harrisburg and received the William T. Hornaday Award from M. J. Golden, Executive Director of the Pennsylvania Game Commission. He said, "These boys are a credit to their community, to the Commonwealth of Pennsylvania, and to the United States."



A Study of 4,000 Groundhogs Discloses Little Known Facts...

Woodchucks Around the Year

By Dr. David E. Davis
Professor of Wildlife Management
Pennsylvania State University

WOODCHUCKS offer a lot of off-season shooting. Even though groundhogs provide summer recreation for thousands of hunters, its life and habits are not well known. For five years we have studied some of the details of their breeding and home life on a large area near Chambersburg in Franklin County that is similar to much of the best woodchuck habitat in Pennsylvania. We trapped and shot about 4,000 woodchucks, and examined many of them to study reproduction and disease problems. We spent much of the time studying the social organization of the groundhogs since it seemed clear that this behavior was important in regulating the population. We are reporting the results of this research so that hunters and landowners will have a better understanding of this popular game animal.

Ground-hog Day—Fact or Legend?

Woodchucks come out of hibernation in the first few days of February.

Actually, the dates for five years are as follows: January 31, February 1, February 3, February 2, and February 1. These dates are, of course, surprisingly close to the legendary groundhog day, February 2. There seems to be good basis for this relationship since the legend originally developed among the Pennsylvania Dutch farmers in the southeastern region of Pennsylvania. After groundhogs first appear they may go back in their burrow for as long as a week. The first individuals to come out are always males and indeed females rarely come out before February 20. About 85 per cent of the groundhogs seen during February are males. Yearling animals come out about the same time as the females.

Producing a New Crop of Woodchucks

When the animals come out of hibernation, they are sexually active and begin to breed at once. The males have sperm in the testes and will mate with the females as they emerge. Most of the young are born within the 3 weeks between April 1 and 21. By April 10 half of the females have produced their litters. Occasionally a female has young far outside this period; a female shot on May 26, 1956, had just given birth. Females have only one litter per year, and the young are suckled for about 44 days. The earliest litters are weaned about May 10 but some are still suckling as late as June 5. Almost all of the adult females reproduce, but sometimes only half of the yearlings have embryos. The amount of breeding by yearlings depends in part on the number in the population. The female may lose some embryos during pregnancy. She may start off with over 5 but on the average lose about one, thus giving birth to 4. Yearlings have smaller litters than do adults. The loss before birth may be 25-40 per cent, apparently varying with the density of the population. All of these values can be grouped together into one called the birth rate, namely, the young born per woodchuck (males and females) in the population. This value may vary from as low as 0.9 to as high as 1.9.

GROUND-HOG DAY when woodchucks emerge from hibernation does have some basis in fact. Five-year study showed first chucks appeared above ground surprisingly close to February 2.

Home Range and Movement

After the young become independent about July 1, woodchucks feed, loaf, and accumulate fat for the winter. During the breeding season woodchucks actively maintain a home range by fighting to drive out other individuals that attempt to come into their neighborhood. Naturally, the larger and more experienced individuals are successful in dominating those lower in the social order. After the first few weeks of July the young of the year leave their burrows and spread throughout the entire area searching for a place to settle down. There is considerable movement even among the yearlings and a few adults. The dominant individuals have a larger home range than do the subordinates. In fact, many low ranking groundhogs spend the whole summer buffeted from pillar to post within the area. Around the first of August the animals begin to lay on stores of fat. Within a matter of weeks a large woodchuck weighing ten pounds may add a pound or even two principally in layers in the abdomen and on the back.

Underground for Winter

By the end of the summer the dominant individuals that have remained secure in an area are plump and ready for hibernation. It appears that subordinate individuals that have never been permitted to settle down do not put on fat and perhaps delay going into hibernation. Under these circumstances, a high proportion of them die. Woodchucks enlarge a part of the burrow to make a hibernating cavity which is lined with grass and perhaps a few leaves. After the groundhog goes into the den it plugs up the entrance for as much as six feet in some cases. From mid-October to February the animals sleep. They maintain their body temperature at about 44° F. and breathe at a rate of about 4 per minute. During hibernation only a small amount of the fat is used up since an animal having such low temperature and metabolism does not need much fuel for energy. However, when the animal comes out in February it needs every ounce of fat since practically no food is available. During hibernation, perhaps only ten per cent of the fat is lost whereas during the month of February the animal rapidly becomes lean and the fat deposits disappear. The groundhog has a relatively active existence excepting during the wintertime when he has a marvelous mechanism for maintaining life at a time when the food supplies are very scarce.

NOW IS THE TIME FOR ALL GOOD DOGS...

Owners and trainers of hunting dogs are reminded that the Pennsylvania Game Law stipulates: "It is unlawful for the owner of any dog or a dog under his control to permit such dog to chase, pursue or follow upon the track of any wild bird or wild animal, either day or night, between the first day of April and the thirty-first day of July next following."

All too often, roaming dogs follow natural instincts and hunt on their own. Free-running canines are a particular hazard to ground nesting game birds, their eggs and small wild animals and young. Also, in spring and early summer dogs kill many doe deer heavy with fawn, as well as adult deer and young of the species.

Any person who owns or harbors a dog that destroys wildlife, poultry, livestock or property is held responsible for the animal's depredations.

Obviously, the humane, good citizen course is to keep dogs penned, tied or under close control at all times, thereby complying with laws relating to such animals and preventing penalties levied for their misdoings.

WALKIN' SHOES

By NED SMITH

Whose Nest Is That?

1. What Pennsylvania bird builds the smallest nest?
2. What familiar bird uses mud to reinforce its nest of grass, leaves, and rootlets?
3. Where did chimney swifts build their nests before there were chimneys?
4. Name one bird that excavates a tunnel in the ground in which to lay its eggs.
5. What Pennsylvania bird builds the largest nest?
6. What material does the chipping sparrow use to line its nest?
7. Can you name another bird in addition to the woodpeckers that excavates a nesting cavity in trees or posts?
8. Do all ducks nest on the ground?

MIGRATION is over. The hustle and bustle of birds on the move have subsided and in field and forest life has assumed a more sensible tempo. A few of the early nesters—the waterfowl, the woodcock, many of the hawks and owls, and others—are already feeding hungry mouths, but most birds devote early June to nest-building, laying, and incubating.

Bird students will want to spend every available minute afield, for this is the climax of the birds' year. The careful observer can learn firsthand many of the secrets of their private lives—how the nests are fabricated, the role of each parent in their construction, how the eggs are cared for, what the young are fed, and how they are raised. It should be mentioned, though, that such goings-on should be watched from a discreet distance through binoculars or a 'scope, for too much disturbance will often lead to desertion of the nest, or may direct predators to the scene.

The nests themselves deserve more than fleeting attention, and by locating them now and examining them more thoroughly after the nestlings have flown you can be sure what species of bird made them. Some nests, you will find, are among the most remarkable structures manufactured by any wild creatures. With only their bills, and in some cases their feet, these feathered artisans become weavers, potters, carpenters, and excavators.

Nests are not the true homes of birds. They serve only to hold the eggs during the incubation and in many cases to shelter the young until they are ready to face the rigors of life "on the outside." The nests of those species whose young are able to skedaddle about shortly after hatching are usually simple depressions in the ground, with or without lining. Those intended to house helpless fledglings for some weeks are either well-concealed, comfortable and substantial nurseries, or they are placed in nearly inaccessible locations.. The materials

used in their construction might be grasses, twigs, mud, leaves, stones, feathers, hair, or nothing at all—for there are birds that deposit their eggs on the bare ground. Cowbirds go them one better, of course, laying their eggs in the nests of other birds. In size they range from the eagle's ton of sticks to the walnut-sized cup of the hummingbird.

As a rule the female bird builds the nest, although the males of many species collect some or all of the nesting material. Male wrens seem uniquely smitten with the building bug, for they commonly construct one or several "dummy" nests which are not used.

Apparently nest building is directed by precise and well-founded instincts, for there is little individual variation among the nests of a single species. Baltimore orioles, for instance, always fabricate tightly woven, hanging bags to receive their eggs. Mourning doves throw together a rather loose platform of sticks, while cliff swallows always form a flask-shaped nest of mud. Chipping sparrows always line their nests with horse hair, if available. Cooper's hawks use chips of bark, and wild waterfowl use down plucked from their breasts. For this reason most nests can be identified on sight.

Nesting sites generally show a specific preference, although certain individuals have odd ideas of what constitutes a proper location. Carolina wrens, for instance, nearly always nest in some sort of cavity or shelter, but their selections can be laughable. One pair of these birds built three nests in one season under a shed roof where odds and ends were stored. The first of these was in a wooden box, the second in a discarded chamber bucket beside it, and the third in an empty cookie bag! Robins not only build in tree branches but also place their mud and grass nests on any shelf-like support. The fact that these ledges might be window sills, railroad signals, barn door tracks, stepladders, or temporarily idle automobiles makes the selection no less typical of the species. Chimney swifts originally glued their nests to the inside of hollow trees, and only in comparatively recent times have they converted to the more readily available brick smokestacks of civilization.

To help you identify unoccupied nests I've prepared illustrations of the various types. If the nest in question is not shown its description might be found in the paragraph in which reference is made to the illustration most closely resembling it.

1. Killdeer—This large plover lays its eggs in a small depression in the ground. The lining, if any, consists of a few bits of grass, weed stems, or small stones. It is generally placed in a field. The woodcock makes a similar nest lined with a few leaves. It is usually situated in open woodlands, but sometimes in abandoned fields. Some birds, notably the nighthawk and the whippoorwill, make no nest at all, the former laying its eggs on the bare ground of open fields or on the flat roofs of buildings. The whippoorwill deposits its eggs on the ground in wooded areas. The duck hawk's nest is a bare niche in a high, rocky, and usually inaccessible cliff. The turkey vulture places its eggs on the ground or in a hollow log.

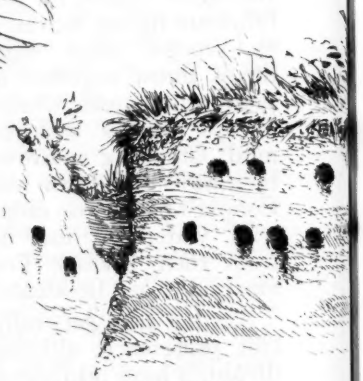
2. Ruffed Grouse—Our state bird's nest consists of a depression in the ground neatly lined with dry leaves, usually at the base of a tree or stump, but sometimes beneath a bush or against a prostrate log. In woodlands the ring-necked pheasant forms a similar nest, but in the fields, a more typical location, it is lined with grasses and weed stems. The nest of the bobwhite is generally placed in a grassy fence row or similar situation. It consists of a depression in the ground lined and arched over with grasses and fine weeds.

3. Mallard — The nests of wild waterfowl are strikingly similar, with the exception of a few tree-nesting

1. KILLDEER

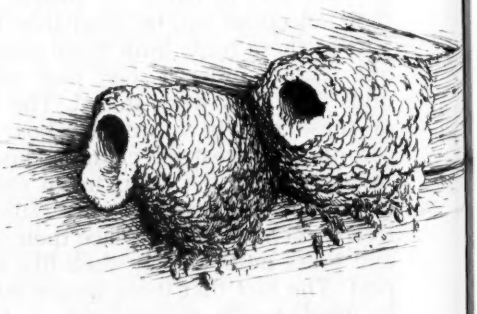
2. RUFFED GROUSE

3. MALLARD



4. BANK SWALLOW

5. CHIMNEY SWIFT



7. CLIFF SWALLOW

6. PHOEBE

NED SMITH

species. Typical of the group, the mallard's nest is generally a depression in the ground, usually at least partially concealed by overhanging brush or grass. It is thickly lined with grasses and down plucked from the breast of the duck. Much larger, the nest of the Canada goose is similar. Most other ground-nesting birds make a more elaborate nest. The meadow lark, for instance, forms a cup of dry grasses in grassy fields. The surrounding vegetation is formed into an arched roof over the nest and a tunnel-like side entrance is sometimes added. An even more compact cup of grasses, fine rootlets, and leaves lined with fine grass placed on the ground or sometimes in low bushes is the nest of the song sparrow. The towhee's nest is placed on the forest floor. It is a cup of grasses, weeds, leaves, and strips of bark lined with fine grasses. Unmistakable is the ovenbird's woodland nursery, a depression in the ground lined with leaves and stems and arched over with the same materials, forming a side entrance.

The pied-billed grebe makes a unique nest—a raft of rotting aquatic vegetation floating among the standing plants of a lake or pond.

4. Bank Swallow — A sandy bank riddled with small holes is likely the nesting site of a colony of bank swallows. Each tunnel is up to six feet deep, ending in a nest of grasses and feathers. The rough-winged swallow lays its eggs in a grassy nest in holes in banks, or in crevices in stone walls or rocky cliffs. The belt kingfisher excavates large burrows in stream banks in which its eggs are laid. The only lining is a gradual accumulation of fish scales and bones.

5. Chimney Swift — A skimpy bracket of twigs cemented to one another and to the inside of a chimney with the bird's saliva is the distinctive nest of the chimney swift. Less frequently it is situated inside a hollow tree, the bird's ancestral home.

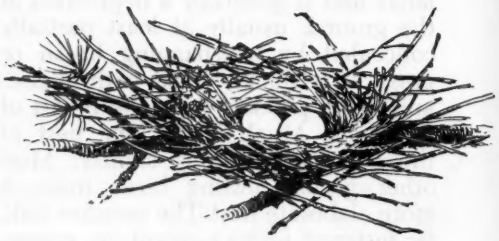
6. Phoebe — This familiar flycatcher makes a deep cup of mud and mosses, lined with soft vegetation. It is placed on ledges beneath overhanging cliffs, under bridges, or in similar places. The familiar barn swallow makes a cup-shaped mud nest lined with feathers and stuck to the side of barn timbers, as a rule.

7. Cliff Swallow—This bird's flask-shaped mud nests are generally attached in numbers to cliff faces, barn timbers, culverts, or beneath barn eaves.

8. Robin—Few nests are as familiar as this one. Its foundation and exterior consist of grasses, leaves, rootlets, paper, straw, and weeds thickly lined with mud. This, in turn, is lined with finer material. Nest sites are varied—fruit trees, evergreens, shrubbery, or on ledges of buildings. The wood thrush builds a similar nest on small understory trees. It is heavily reinforced with mud and is often adorned with paper.

9. Mourning Dove—Usually placed on horizontal limbs of pine or deciduous trees, the dove's nest is a shallow platform of small twigs and weed stems and rootlets, loosely constructed and sparsely lined. Herons construct similar, but much larger nests in bushes and trees near water. Crow nests are larger than dove's and in addition to the twigs, contain grasses, strips of bark, etc. With a few exceptions hawks build bulky stick nests and these are generally high in deciduous or evergreen trees. Cooper's hawks generally line their nests with flakes or chips of bark, while green leaves or sprigs of hemlock are often found in red-shouldered hawk nests. The bald eagle's nest is a huge mass of sticks generally placed high in a tall tree. As the same nest is used year after year and fresh material added each season these structures attain tremendous size. They are commonly eight feet in diameter and more than that in depth. Great horned owls nest in hollow snags or in old hawk or crow nests, long-eared owls contruct their own

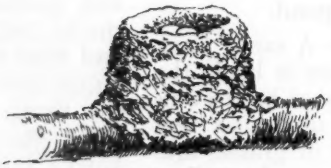
8. ROBIN



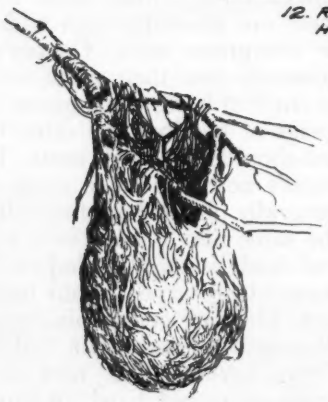
9. MOURNING DOVE

10. CATBIRD

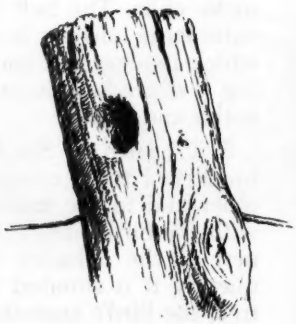
11. RED-WINGED BLACKBIRD



12. RUBY-THROATED HUMMINGBIRD



13. BALTIMORE ORIOLE



14. DOWNY WOODPECKER

NED SMITH

platform of small sticks or add a layer to the top of an old crow or squirrel nest.

10. Catbird—The familiar catbird builds a nest of twigs, bark strips, and rootlets, and lines it with finer strips of bark and rootlets. A larger, but similar nest would probably belong to the brown thrasher. The cardinal generally uses fewer twigs, more grasses and grapevine bark. The lining is mostly pine needles or fine rootlets. These three, the cardinal, catbird, and thrasher, build in the same sites–generally in dense shrubbery.

11. Red-winged Blackbird—The red-wing attaches its compactly woven cup of dry grasses to bushes or cattail stalks. The yellow-breasted chat, nesting in dry thickets, builds a similar, but smaller nest neatly formed of grasses, weed stalks, and strips of grapevine bark. Still smaller is the neat, compact cup of grasses, rootlets, and bark strips placed in low bushes by the indigo bunting. The chipping sparrow's little cup of weeds and grasses can usually be distinguished by its lining of horsehair. The long-billed marsh wren builds a tight, globular nest of grasses with a side entrance in marshland bushes or rushes.

12. Ruby-throated Hummingbird–Our smallest bird lays its eggs in a tiny cup fashioned of plant down, decorated with lichens and bound together with spiderwebs and plant fibers. It is placed atop a horizontal limb. The wood pewee also saddles the limb with its nest–a larger cup of plant fibers, grasses, rootlets, and moss, covered with lichens.

13. Baltimore Oriole—The oriole's deep, pendent bag-like nest is unmistakable. Tightly woven of string and vegetable fibers it is usually hung from near the tip of a slender tree branch. A thin-walled, pensile cup of tightly-woven grapevine bark and patches of white plant fibers or down, lined with finer bark strips, is the familiar woodland nest of the red-eyed vireo. It is generally hung in a horizontal crotch.

14. Downy Woodpecker—All our woodpeckers nest in holes they excavate in trees or posts. As a rule dead trees are selected, but a few species sometimes select living trees. The downy, our smallest woodpecker, forms a small entrance hole about 1½ inches in diameter. The flicker's entrance hole is about 2½ inches in diameter. No nesting material is used other than a bed of chips. Numerous birds nest in vacant woodpecker holes –bluebirds, chickadees, titmice, nuthatches, sparrow hawks, wrens, and tree swallows. Chickadees often excavate their own holes in dead trees and line them with moss, plant down, and feathers. Bluebirds are partial to downy woodpecker holes in ancient chestnut fence posts. The eggs are laid on a lining of dried grass. The tufted titmouse lines his nest cavity with moss, bark, plant fibers, and feathers, as does the white-breasted nuthatch. The house wren stuffs any suitable cavity with twigs and lines it with feathers. The larger Carolina wren often builds in larger cavities or inside unused buildings, roofing over its bulky nest of twigs, leaves, grasses and stems with the same material. It's hard to imagine the purple martin nesting anywhere but in the houses or gourds erected expressly for him by human admirers. Nevertheless, in some areas they build their nests of grass, twigs, straw, leaves, etc., in crannies of buildings and hollow trees–the latter being their original nesting places.

ANSWERS TO QUESTIONS

1. **The ruby-throated hummingbird.**
2. **The robin.**
3. **In hollow trees.**
4. **The bank swallow, for one; the kingfisher for another.**
5. **The bald eagle.**
6. **Horsehair.**
7. **The black-capped chickadee.**
8. **No. Wood ducks, golden-eyes, and some mergansers nest in tree cavities.**

A Summary Report of
An Emergency Program . . .

Winter Feeding—1961

By C. C. Freeburn
Chief, Division of Land Management
Pennsylvania Game Commission

IF WILDLIFE could reason, it, along with many humans, gave thanks that the 1960-61 winter finally was over. One thing is certain, it was one of the worst winters game birds and animals had to face in many years.

Actually most areas which generally experience severe winter conditions had a near normal winter except for the amount of snow and the early and prolonged low temperatures. The combination of these two could have been devastating to wildlife had they continued for a longer period.

Fortunately the Game Commission recognized the seriousness of the situation and took immediate action to combat it. This together with the unselfish cooperation of individuals, groups, business firms and other state and federal agencies quickly alleviated the situation. As a result, wildlife losses were minimized.

The action of the Commission is commendable, not so much because it recognized the situation, but because the solution meant complete deviation from long established winter feeding policies. It must be realized that winter feeding in former years was confined to turkeys, squirrels, and in some cases pheasants and quail.

Feeding deer grain was neither recognized nor approved. Browse cuttings were made each year on lands, either owned or leased by the Commission, but the distribution of corn for this purpose was taboo. Thus the task confronting Commission personnel last winter was tremendous. It looked like

a long, hard job but through the cooperation mentioned above the solution was accomplished in a little more than two weeks.

Naturally, weather conditions helped, but the Commission was organized and prepared to face almost any eventuality.

How was this problem solved? Briefly by good sense and efficient organization.

Administratively the state is divided into six field divisions, each in charge of a division supervisor with a staff of from 30 to 36 regular salaried employes and a state-wide work crew of approximately 550 men.

These men were contacted immediately and apprised of the situation and told to take any and every action possible to minimize losses of deer and other wildlife due to winter conditions. This was to include the purchase and distribution of corn at locations where it would do the most good.

The task was not easy because it meant opening hundreds of miles of roads in remote areas which were unpassable due to heavy snows. Only a limited amount of equipment necessary for this purpose was owned by the Commission but much more could be rented or borrowed. This was done and many individuals, groups and firms went ahead, completely on their own, with most satisfactory results. All of this resulted in the opening of 2,732 miles of roads, some of it more than once, followed by the distribution of corn for a total of 125,826 bushels and the cutting of 2,470 acres of browse.

The cooperation given by others to help solve the problem was beyond our fondest expectations. Planes for reconnaissance and feeding flights were made available by federal and state agencies as well as individuals and firms. The State Department of Forests and Waters aided with men and equipment for opening roads. Farmers, groups, firms and just plain individuals did the same.

Individuals and groups bought and distributed both hay and corn. Browse cutting operations were organized and in short everything humanly possible was done as quickly as possible by everyone concerned.

Needless to say, the Commission appreciates the efforts of everyone who took part in this project. It cannot begin to enumerate here, the names and addresses of those concerned, but at its meeting on April 21, 1961, adopted the following:

RESOLUTION

"WHEREAS, Snowfall and low temperatures during the 1960-61 winter were of record proportions in many areas of Pennsylvania; and

"WHEREAS, These conditions prompted the Pennsylvania Game Commission to make a temporary exception to its established winter feeding policy; and

"WHEREAS, Many individuals, clubs, organizations, agencies, industries, and the armed services contributed time, money, feed, equipment, and personnel to carry on emergency game feeding operations in efforts to minimize game losses;

"THEREFORE, BE IT RESOLVED, That the Pennsylvania Game Commission, in recognition of the tremendous contributions made by the aforementioned, does hereby extend its appreciation to and sincerely thanks all those who contributed in any manner to the emergency game feeding program."

The known losses of deer and wild turkeys for February and March, 1961, according to field divisions are as follows:

—DEER KILL—

February 1, 1961—March 31, 1961

	Dogs	*Auto*	*Trains*	*Crop Damage*	*Illegal*	*Winter Kill*	*Other*	*Total*	*Turkeys*
N.W.	50	121	4	5	11	62	10	263	9
S.W.	54	109	41	3	8	5	17	237	1
N.C.	165	244	159	3	27	453	14	1,065	107
S.C.	215	115	13	5	27	204	58	637	1
N.E.	149	255	23	9	34	219	22	711	14
S.E.	66	122	14	—	12	3	9	226	—
TOTALS	699	966	254	25	119	946	130	3,139	132

Drum Chorus

FAYETTE COUNTY — On March 26, 1961, while patrolling for stray and wild dogs chasing deer on Game Lands No. 51, Deputy Paul H. Miller, of Mill Run, related he saw twenty or more grouse drumming in the day's patrol. At times, it was almost impossible to keep in touch with the baying mongrels chasing deer for the drumming noises. He says, at one time it sounded like several power chain saws being "warmed up." — District Game Protector Alex J. Ziros, Connellsville.

He Who Laughs Last

POTTER COUNTY — During the past winter, several fox hunters from the Shinglehouse area followed some fox tracks that eventually led to a den hole. After spending considerable time digging, and after one had said he could hear the fox growling, one of the crew happened to look to the side and see, several yards distant, Mr. or Mrs. Fox squatted behind an old fallen tree trunk as much as to say fix it up nice fellows, I live there. — District Game Protector Richard H. Curfman, Coudersport.

Beaver Break-out

CRAWFORD COUNTY — On the second day of this beaver season Harley Hall, of R. D. 3, Centerville, caught a beaver which he estimated at 35 pounds. Because he had to leave for work right away, and the weather was extremely cold, he kept the beaver alive and locked it in his garage so that it would be warm enough to skin out when he returned from work. Upon returning home he discovered that the beaver had chewed the window sash, causing the pane to fall out, which permitted Mr. Beaver to depart for his old stamping grounds on Muddy Creek, flowing a short distance away. This story was revealed to me by Mr. Hall's father-in-law, the Rev. Charles Fuller, Centerville, Pa.—District Game Protector William E. Lee, Titusville.

Black-out

LEHIGH COUNTY—One day late in March, my wife heard a commotion outside the window of our living room. Upon investigation, she discovered that some small children had chased a black squirrel under a small bush in our yard and one small fellow was holding the animal by its tail. After having warded the children off, my wife called me and we herded the rare specimen into a box trap. It appeared in a sickly condition so I kept it under observation for two days, but it was too far gone to nurse back to health and it died. Had it not been molested and had it lived, it may have afforded much enjoyment to the residents of the community as black squirrels are unusually rare, particularly to this part of Pennsylvania. — District Game Protector Edward F. Bond, Allentown.

On Your Mark, Get Set, Go!

UNION COUNTY—The following was related to me by a local farmer, Daniel Catherman, who lives near Hartleton. He had been having some trouble on his farm with stray dogs. Noticing four one day, he grabbed his shotgun and started after them. He had not gone far until he noticed a ringneck rooster keeping pace with him about two corn rows to his right. He continued through the stubble field into another and continued along a woods. The ringneck continued with him. Not able to catch up with the dogs, he turned around and started toward the house. The ringneck turned and followed him to within 75 feet of his barn, then stopped, and would go no farther. He watched until Dan went in the house, then turned and left. Dan is still wondering about the ringneck surveillance.—District Game Protector John S. Shuler, Lewisburg.

Death by Dogs

FOREST COUNTY—At 7:30 a.m. on the 17th of February I received a call from a man who lives in a pretty secluded area. He said that some dogs were really raising a fuss in a patch of hemlocks in the hollow just below his house. I asked him to check to see what they were after and call me back. A few minutes later he called again and said that he only went about half way to where the dogs were and that they must have a bear or a mountain lion cornered because whatever it was, it was really roaring and growling back at the dogs. I told him to wait and I would be there as soon as I could. When I arrived at his place we could still hear the dogs in the same place. Armed with rifles, we started down the hill to see what the dogs had cornered. About half way to the dogs I heard the so-called growling, but it sounded like a deer bleating from pain to me. Shortly we could see three dogs and a deer. Every time the deer would get up all three dogs would hit it at the same time and knock it down. The growling was very loud, fear-filled bleats from a badly crippled young doe. We quickly disposed of two of the dogs, but the third got away. The deer had to be disposed of because of the damage to the hind quarters. If more people could get to see a scene like this, and hear the sounds of terror from the deer they would think twice before they would let their dogs run free to chase whatever they want.—District Game Protector Cecil Toombs, Jr., Tionesta.

Whoo Dat?

GREENE COUNTY—Deputy William Coneybeer of Jefferson, Pa., comes home late every night from work about 1:00 a.m. On steady night shift, Bill is usually exhausted when he arrives home and claims he never needs sheep or pills to make him sleep. This certain night Bill was far off in dreamland when his wife, Mary, screamed and shook him from sleep, saying, "Bill, Bill, wake up, someone is in the room." Drowsily, Bill only rolled over and said, "Ah, go back to sleep, you're just having nightmares." Mary was frightened and pulled the covers over her head, and swoosh, something hit the covers. Mary screamed again, this time dragging Bill out of bed. The lights were turned on and there on the dresser stood a screech owl, in about the same condition as Mary.—District Game Protector Theodore Vesloski, Carmichaels.

Stuffy Stealer

SOMERSET COUNTY — Anyone

see a man or men with plenty of stuffings? That is what the Windber Borough Police were investigating March 16, 1961. It seems that trophy admirers, while visiting Patrick Farbo's Taxidermist Shop, had walked off with a stuffed fawn deer, a stuffed deer head (buck), and a stuffed squirrel. Less than twelve hours later, the admirers were caged and stuffings returned. — District Game Protector James Burns, Jr., Central City.

Masked Marauders

ERIE COUNTY—Marshall Young, of Union City, reported of hearing a commotion in a vacant house he owns. He obtained a gun and unlocked a side door, then started to open it. What appeared to be a small hand came through the opening and pushed on the screen door. Out walked a very large and dirty raccoon. The raccoon looked so innocent and apologetic that Marsh did not have the heart to shoot it. Soon another raccoon made his exit the same way. Upon investigating Mr. Young determined that the animals had entered the house by going down the chimney. Honey bees had stored honey and lived in the wall of the kitchen. The raccoons had removed the plaster, torn away the lath and consumed the honey, leaving quite a mess. The animals must have known the honey was there and so entering and breaking was the best way to get it. — District Game Protector Elmer Simpson, Union City.

Male Bullets

ALLEGHENY COUNTY—Recently while giving a talk on firearm safety to a group of Boy Scouts, I was trying to impress upon them how dangerous a bullet could be. I held a .22 shell in my hand and explained to them that this bullet could kill a man at a distance of one mile. Immediately after I said this, one of the boys asked me, "How about a woman?"—District Game Protector George T. Szilvasi, McKees Rocks.

Food Plot Full

PERRY COUNTY—On March 23, I was assisting Game Protector Robert Shaffer in locating reported turkey hunting in Tuscarora Township of Juniata County. While going to State Game Lands No. 215 to secure information on the location of one of the individuals involved, we were treated to a pleasant sight taking place on one of the food plots located on the said game land. In the plot were four deer feeding and directly behind them and about ten yards away were three hen turkeys and a beautiful gobbler. The sun was in the right position to show off all their colors, both the turkeys and the deer. Needless to say both Shaffer and myself possess excellent movie cameras and use color film but the cameras were at home and another excellent opportunity was lost. — District Game Protector James Moyle, Blain.

Gone Goose

CRAWFORD COUNTY—On March 26 at approximately noon I observed a strange goose to this area and identified it as a white-fronted goose, or specklebelly. I called Waterfowl Management Agent Sickles and had him come over to confirm the find. Ray was here in short order and said that this was the second in 17 years at the Refuge, to his knowledge. Later I was at the museum and mentioned it to some people and before the day was over approximately 300 people had seen this rare bird.—District Game Protector Paul R. Miller, Linesville.

Merry-Go-Round

CUMBERLAND COUNTY—When a dog bites a man that's not news but when a man bites a dog that's news. So goes the old story. Recently I heard a story along these same lines. A local farmer was spreading fertilizer on his field just after the thaw from the big snow when his beagle pup spotted and chased a fox which it spotted along a fence row. The dog chased the fox out of sight but not out of hearing. Suddenly the usual baying turned to cries for help. Back came the pup with a red fox in hot pursuit seeking refuge from his owner who was driving a tractor. The farmer had to get off the tractor and drive the fox away from the cowering beagle.—District Game Protector Eugene Utech, Carlisle.

Rock-a-bye Woodie

BUCKS COUNTY—The wood duck, one of the few species of waterfowl which makes its nests in cavities above the ground or water, seems to be quite fond of the Bucks County area. It is not uncommon to see many pairs of these birds along the creeks, marshes, and the Delaware River each spring.

Because of this beautiful duck's partiality to our locale and the difficulty it has in finding suitable nesting sites, the Game Commission has provided for the wood duck's comfort by erecting more than thirty nesting boxes, at various attractive locations within the county.

This has been a profitable enterprise inasmuch as the boxes have produced a like amount of broods each year with a remarkable regularity.

This spring we were somewhat late in preparing the nesting boxes for the arrival of the woodies. When we inspected them in mid-March we were alarmed to find that some had been pushed over by the movement of heavy ice and were reclining at angles of up to 45 degrees. However, we are pleased to report that straightening operations will have to be postponed until after the nesting season. All of the boxes thus affected contained clutches of eggs and expectant mothers. — District Game Protector William J. Lockett, Doylestown.

Popcorn for Squirrels

PIKE COUNTY—Several days ago I went to the metal storage building at State Game Lands No. 183. I started the flat-bed truck that hadn't been run for about a week. When the truck started I heard a noise that sounded like small stones being thrown against the building. Stepping out of the truck to investigate I was somewhat astonished to see grains of corn being shot out of the exhaust pipe against the metal building. I honestly believe the squirrels that stored the corn in the exhaust system had the intention of making popcorn. — Land Manager Wilmer R. Peoples, Hawley.

174 Years of Service

MONTGOMERY COUNTY—Some of the public and the sportsmen little realize the length of service our unsung heroes, the Deputy Game Protectors of our state, have given to conservation. These unpaid conservation-minded men are the backbone of any district in the state, and should certainly be praised for their efforts over the years. My own deputy force, for example, is something that I always like to brag about. Without them I could not even start doing the type of job that is required of us. My top six deputies in years of service represent 174 years with the Pennsylvania Game Commission. I also have 12 other deputies who range in years of service from two years to twenty years of Game Commission service. They say that a man must love his job to work without pay, and if that is the case, then the deputies of our great state must be without doubt one of the most dedicated group of conservationists anywhere in the world.—District Game Protector William E. Shaver, Harleysville.

Ruler of the Roost

CENTRE COUNTY — During the recent heavy snow, a hen turkey took to the "city," as life was easier there. It stayed in the large Norway spruce trees at the edge of Unionville, Pa., and fed at a squirrel feeder, which was within 10 yards of Harold Watson's home.

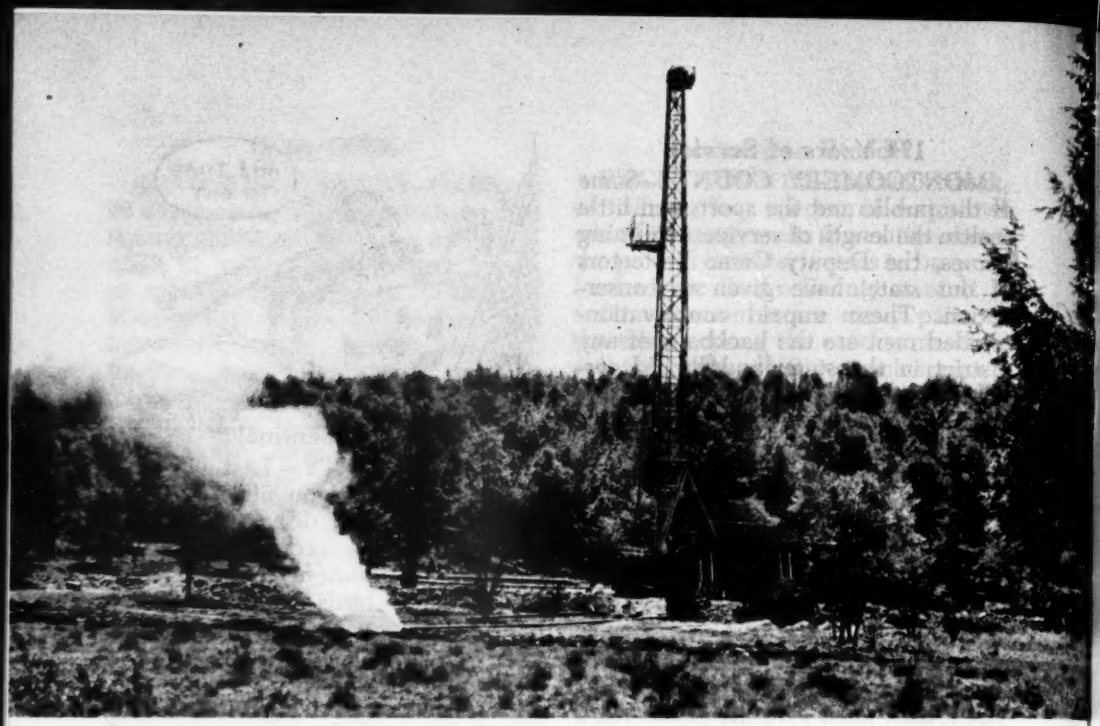
Cal Spotts, operator of a service station across Route 220 from Mr. Watson's home, watched the turkey about every day for tbout three weeks. By this time Mrs. Hen decided she was the boss, for the squirrels and birds had to move when she came near the feeder. However, Mr. Spotts and others at the service station were quite surprised to say the least, when they saw Mrs. Hen chase Watson's house cat across the lawn and onto the porch on the morning of March 4.—District Game Protector Charles M. Laird, Bellefonte.

Silent Sentinel

PERRY COUNTY — Last winter I was called to check on a flock of quail that was gradually disappearing. The woman who was feeding them every morning said that in the beginning there were 26 birds in the covey and that now there were only 14 birds left. The woman said that whatever was taking the quail must be doing it at night as there was a big old bird that would fly up and sit on a tree and watch over the quail every time they would come in to feed in the morning. The next morning I went out to where the quail were feeding and sure enough there sat a sharp-shinned hawk watching over his winter supply of quail or at least waiting a chance to pick up his breakfast.—District Game Protector Jacob I. Sitlinger, Newport.

A Carrot a Day . . .

DAUPHIN COUNTY — If the old adage that carrots are good for the eyesight is true, then the deer in Stoney Creek Valley should be more wary and be better able to sight the hunters this fall. During the winter and the heavy snows approximately 60 bushels of carrots were donated to the Game Commission from a cold storage packing firm. These were spread around known concentration areas of deer on State Game Lands No. 211 and for about 10 days nothing happened. Not a thing ate them. Then it began to happen. Some were nibbled on and the good word spread. Within a week all the carrots were completely eaten down to the last little bite. — Land Manager Ralph L. Shank, Pine Grove.



Pennsylvania Sportsmen Benefit When Exploration Reveals . . .

Productive Sands Under State Game Lands

By John B. Sedam, Chief
Division of Minerals

IF YOU have kept an eye on State Game Lands in western, south central and northern Pennsylvania, you may have observed "clouds" of light colored dust sifting through the trees, or noticed in the background a tall rotary well-drilling rig in operation. But Why, Where, and How does this affect the sportsmen?

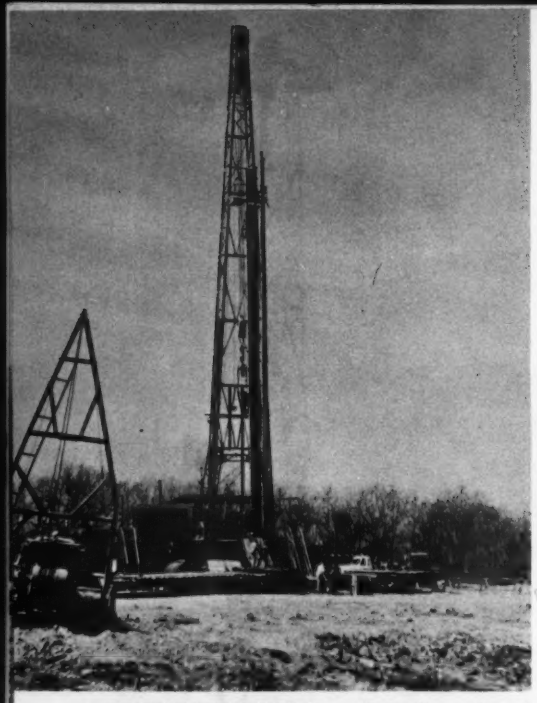
Several years ago the Pennsylvania Game Commission reaffirmed many policies, including one which approved the leasing of Oil and Gas Rights in State Game Land acreage. This measure or policy was adopted to protect the licensed hunters' investment, by encouraging the drilling of exploratory wells. Thus, if gas or oil is found, the possibility that these natural resources might be drained from under State Game Lands by wells located on adjoining private land is reduced.

Clouds of white dust and the roar of diesel-powered machinery – many hunters have noted these telltale signs of the now common rotary drilling rigs as exploration of the rock layers and gas bearing sands several thousand feet below the surface of State Game Lands progresses. This powerful, efficient rotary equipment has largely replaced the smaller cable-tool drilling rigs, commonly used for shallow wells. At many locations the

operators still use the cable-tool rig to drill the first 1,100 to 1,200 feet of a deep well. Then the rotary drilling rig moves in and completes the well by drilling several thousand more feet to the Oriskany or deeper sands that may produce natural gas. The operation of this massive drilling equipment is complex. However, the principle involved is the drilling of a hole by the continuous rotation of a hard carbon-tipped bit. This bit is on the end of a hollow drill pipe turned by powerful machinery located on the surface. Compressed air, developed by equipment at the well, or natural gas piped to the location from another well or pipe line, is forced down through the hollow drill pipe to blow the rock cuttings or dust out of a pipe at the top of the hole. Thus, the dust "clouds" referred to in this article are formed. Under certain circumstances it may be necessary to use water or special chemical compounds when drilling with this equipment.

You must see these massive rotary drilling rigs, with derricks towering over 140 feet above the ground and the giant diesel-powered engines, to realize the great investment that many companies have in this natural gas exploration and development. Each rig capable of drilling from 5,000 to 10,000 feet represents an outlay of approximately $300,000. For drilling deeper wells the equipment costs are proportionately greater. The rotary set bits cost many hundreds of dollars and two to ten bits are normally needed to complete a well, depending of course, on the hardness of the rock structure. Most of the so-called deep wells are drilled to depths varying from 6,000 to 8,500 feet below the surface. The cost of the operation, if work progresses without difficulty, usually exceeds $80,000. Many companies, con-

ROTARY DRILLING RIG costs about $300,000 for wells going down to 10,000 feet. This one is operating on State Game Lands No. 26, Blair County.



PRODUCTIVE WELL on State Game Lands No. 42, Westmoreland County, gave an initial daily open-flow of 9,115,000 cubic feet of natural gas. This rotary rig drilled from the surface to a total depth of 7,585 feet.

BUSINESS END of a rotary bit is turned by powerful machinery located at the surface. Compressed air or natural gas is forced down through a hollow drill pipe to blow rock cuttings or dust out of a pipe at the top of the hole.

sidering the cost of administration, access road construction and actual drilling, allow a budget of $100,000 for each well. The reader can plainly see that exploration for natural gas is considered "Big Business," with the Commission benefiting financially when productive gas wells are drilled on State Game Lands.

The Benezette, Driftwood, Greenlick, Leidy, Rockton and Wharton natural gas fields; later the Johnstown Prospect, Somerset and Fayette County explorations and now a new gas field below Duncansville in Lower Blair County, have added to the interest and the expansion of this industry. Other natural gas fields have developed on state and private lands throughout the Commonwealth.

The pros and cons of oil and gas exploration and development as conducted on areas managed for wildlife provide an interesting topic. With the construction of access roads and pipelines required for transportation of the natural gas, many previously wild and remote areas have been made accessible. The resulting change in vegetation, the open soil which provides dusting areas and the forest edges developed by the cutting of timber along the rights-of-way have improved the home or environment for many forest game species.

Observant hunters and company employes servicing the well locations often observe wild turkeys and ruffed grouse feeding along the seeded pipeline rights-of-way. The game birds mentioned above are dependent upon the grassy forest openings to provide insect life and tender greens required as they raise their young. On these sunny well-drained open areas one often sees the telltale hollows or small depressions in the loose soil where grouse and other bird life have been dusting. Deer are regular customers along these pipeline cafeterias, obtaining tender greens from the grasses and clover on the seeded areas, acorns or beechnuts that fall from the bor-

dering trees and browse from the sprout growth along the edges of the openings. Even the hearty cottontail rabbits appear along these openings, often at locations where they have not been seen for many years. Indeed, proper roadside and pipeline management has become a favorite tool for the Wildlife Manager who is developing areas for forest game species.

Lease roads and pipelines provide access into hitherto inaccessible hunting territory. The effect has been to spread out hunter activity and hunting pressure, and allow additional opportunities for sportsmen to harvest the wildlife produced on State Game Lands. The city hunter and those that normally do not wander far from established trails, due to fear of becoming lost, are now able to cover new and often better wildlife range. While a few of the more rugged native sportsmen object to this invasion of areas that they formerly hunted without competition, the interests of all must be considered.

Proceeds from the leases on the State Game Lands, under a policy adopted by the Pennsylvania Game Commission, are earmarked to be and have been spent on capital improvements such as field office buildings and the acquisition of additional acreage for State Game Lands which will be available to the hunting public. Therefore, as you observe columns of dust rising above and around the spectacular rotary drilling rigs on State Game Lands, it will be with the realization that sportsmen's interests are protected.

FOOD FOR WILDLIFE has been created on this pipeline running over State Game Lands No. 42, Westmoreland County, by seeding the cleared strip to clover and grasses. The strip also serves as an access road to productive natural gas wells.

EDGE EFFECT is a top priority goal in any wildlife habitat program. This pipeline right-of-way over State Game Lands No. 93, Clearfield County, provides food through reseeding the strip to clovers and grasses as well as nearby cover.

MOST SUCCESSFUL GAME BIRD IMPORT ever introduced to America is the ring-necked pheasant. There was no biological investigation to determine its adaptability to our terrain and climate. Such success and luck have not been duplicated since.

Finding Game Species To Fit Existing Habitat...

THE PRINCIPLES OF GAME MANAGEMENT

Part VI—Game and Habitat Analysis

By John Madson and Ed Kozicky
Conservation Department—Olin Mathieson Chemical Corp.

LARGE-SCALE habitat improvement is the most effective way to increase an annual game crop.

It's also the most expensive, and no state conservation department can possibly pay for the habitat improvement known to be needed by a game species on a state-wide basis. With their limited funds, state game managers can do little more than improve habitat on a demonstration basis—either on private lands or state game areas—and strive to convince sportsmen and landowners of the vital role of habitat improvement in effective game management.

But if it is not feasible to improve a habitat for game, it may be possible to find game that can succeed in the habitat as it exists. This may be done by introducing an entirely new game species, or by developing a different strain of resident game.

This new game management tool might be described as a *game and habitat analysis* technique—a study of the game species and its requirements, combined with experimental releases of that game on test areas. This approach is far different from the old technique of mass-releasing a new game species with little, if any, biological evaluation of species and habitat.

Introducing a new game species entails trapping and transplanting. This is not "stocking" in the usual sense,

for it is not a replenishment of resident game but an actual establishment of a new species that exists in a similar habitat elsewhere. "Elsewhere" may be an adjoining state or a mountain on the other side of the world.

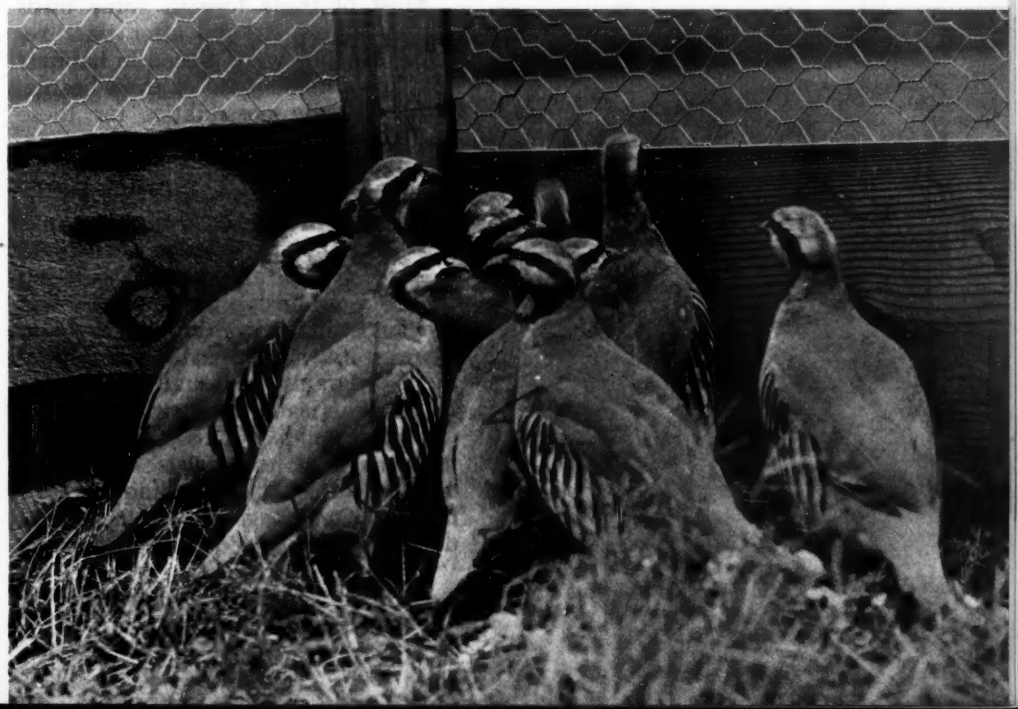
This game introduction can involve native or foreign game. It is often useless to introduce a native American game species that has never existed in the area of release—for instance, releasing pronghorn antelope in northern Maine. It is often possible however, to re-introduce a game species successfully into an area where it once existed, even though that may have been before modern memory. For example, wild turkeys have been successfully re-introduced into South Dakota after an absence of many years.

It may also be possible to introduce well-established foreign game birds. Some state conservation departments have set up special stations in an effort to develop strains of game birds that can survive in areas where those birds have never before succeeded.

For example, the Missouri Conservation Commission is working with

HUNGARIAN PARTRIDGES were raised on State game farms and released in Pennsylvania between 1925 and 1944. All efforts to permanently establish this bird here proved unsuccessful.

CHUKAR PARTRIDGE is another game bird that refused to become a native Pennsylvanian. More than 2,500 of these birds were liberated here between 1935 and 1940 without success.



two strains of black-necked pheasants and a strain of ring-necked pheasants in an effort to develop a bird for a more southern climate and poorer soil. Crosses of these strains are being test-released in the northern part of the state.

This program was prefaced by a detailed study of the various pheasant strains to find subspecies that have the greatest chance of success. Similar studies are being made of the bamboo partridge and the Reeves' pheasant for other regions within the "Show-Me State."

The most spectacular type of game introduction occurs when a foreign species is immensely successful and partly or wholly fills vacancies caused by the disappearance of native game.

The dramatic success of the ring-necked pheasant in the upper Mid-west is a classic example. As the virgin prairie was put to corn, oats and wheat, the native pinnated grouse or "prairie chicken" faded. A new habitat had been created, and it was unfilled by any large upland game bird.

With the introduction of the ring-necked pheasant in the 1920's, this new habitat was swiftly filled by an amazingly rugged, sporty and colorful game bird that was hailed by sportsmen and game managers alike. Concurrent with the success of the ring-neck were the introductions of the chukar and Hungarian partridges. These three exotic game birds have at least reinforced native bird populations, and in some cases have entirely replaced certain native game birds which found the changing habitat intolerable.

There was no biological investigation to determine the ringneck's fitness for North American tenancy. The bird was simply introduced, and it took.

Flushed with success, many American sportsmen and some game managers hopefully began to release other game birds: African guineas, francolins, capercaillies, coturnix quail, sand grouse, and golden, Reeves' and Lady Amherst pheasants. None of these became well established, and the ringneck's phenomenal success story has not been repeated.

Most of these foreign game birds simply vanished soon after their release, for they were placed in habitats that were inadequate or even hostile. However, the possibilities for these and other species have not been exhausted, even though many game introductions have been disappointing.

This recent approach of either finding a new game species or developing a successful strain for the existing habitat is promising. Habitat improvement is still the best answer to game scarcity, but broad habitat improvement programs are usually too costly to be practical. An alternative is to find or develop game that can thrive in the habitat as it exists. The *game and habitat analysis* technique won't fill our game bags overnight, but it deserves consideration and support.

REEVES PHEASANT was tried experimentally in Pennsylvania. Betwen 1932 and 1937, 723 of these colorful birds were raised and released. No natural reproduction in the wild was obtained and the experiment was discontinued.

HUNGRY YOUNG of all birds seem to have a never-ending appetite. This female catbird will have to make constant trips to satisfy her three open-mouthed fledglings.

There's No Truth in This Figure of Speech...

Eating Like a Bird

By Dr. Leon A. Hausman

YOU'VE often heard someone remark, "I'm not at all surprised that Bill is getting so skinny. He eats just like a bird." The implication, of course, is that Bill eats very little, just pecks around here and there without getting any substantial amount of food. It likewise implies that a bird does just that, too.

Such a statement is very far from the truth, indeed. In fact, even a short study of the eating habits of birds in the wild will convince you that just the reverse is true. During almost every waking minute a bird is continually sending down its gullet an unending stream of food. Even some of the larger birds that cram their crops full almost to bursting, then digest and absorb the food at their leisure, are doing this very thing.

So does the tiny hummingbird which feeds constantly and has no crop for storage. The conditions under which this bird feeds and roosts at night, however, require separate mention. Since the hummingbird possesses no crop, it cannot store food for the hours of night and roosting. Hence, its body temperature drops to a point

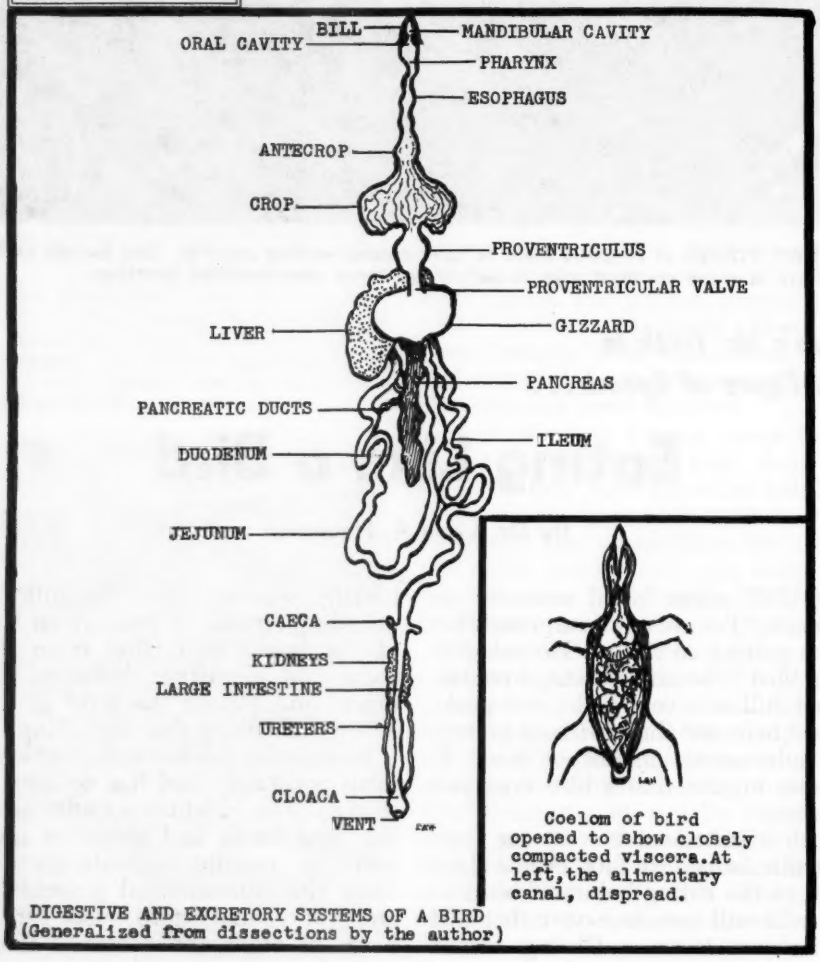
near the temperature of its environment. This is vitally essential in order that its high body temperature of daytime, thus reduced, may not literally "burn the bird up" before morning. Such a condition is known as partial hibernation, or thermal dormancy.

It can truly be said that, in proportion to their size, most birds eat more, and eat more continuously, than any other backboned animal. If Bill actually did "eat like a bird," he would soon arrive at the weight of 300 pounds or at least the local undertaker's morgue.

Game birds, such as grouse, quail, pheasants, turkeys, etc., or birds belonging to the gallinaceous family, rapidly cram their crops full of seeds, buds, bits of fungi, grains and the like. Then, during periods of resting, this food is gradually released down into the stomach for further digestion. Hawks and owls do the same with the prey they have swallowed, distending their crops almost to the burst-

DR. L. A. HAUSMAN
FITZWILLIAM
NEW HAMPSHIRE

EATING LIKE A BIRD



DIGESTIVE AND EXCRETORY SYSTEMS OF A BIRD
(Generalized from dissections by the author)

Coelom of bird opened to show closely compacted viscera. At left, the alimentary canal, dispread.

HUMMINGBIRD feeds constantly but has no crop for storage. This condition, known as thermal dormancy, prevents the bird from literally "burning up" at night when it is roosting.

ing point and then eating nothing for hours or even a day and a night. The crop rolls up indigestible fur, bones, cartilage, feathers, claws, etc., into neat compact masses known as pellets. The esophagus then forces them into the mouth cavity, from whence they are ejected. But even with such birds, "feeding" is going on continuously in that a trickle of food is unendingly traveling down from the crop into the stomach (proventriculus), gizzard and small intestine for absorption into the blood capillaries.

Before going any further, take a look at the generalized diagram of a bird's food-disposal plant. The food, seized by the bill, is passed into the mouth cavity where it receives only a very small amount, if any, of saliva. The salivary glands of most birds are very poorly developed. The food then passes down through the pharynx into the gullet (esophagus) and so into the crop (sometimes called the craw). Here it is mixed with crop-mucus, a thin, slimy fluid secreted by cells lining the crop walls. In pigeons, it is this crop-mucus filled with sloughed-off cells which makes up the thick, buttermilk-like material known as pigeon-milk. The adult birds regurgitate this substance into the mouths of the squabs.

From the crop the food-mass travels down into the first portion of the stomach, the proventriculus. Here digestive juices are poured into the mass which then descends into the second portion of the stomach, the gizzard. There the thick muscular walls, aided in some birds by grit (gizzard stones) compress and squeeze and grind the food until it is about the consistency of a heavy cream. A student of mine once called it "cream-of-food" soup and the term is a good one.

The crop, proventriculus and gizzard of birds are rather unusual structures in the vertebrate family and are highly specialized for their several functions. The crop is used for storing, the proventriculus for beginning the digestive process, and the gizzard for grinding. You might almost say that

the gizzard does the bird's chewing for it because not since the days of the early fossil birds have there been any teeth. You remember the phrase, "as scarce as a hen's teeth."

Up to this point no food has entered the bird's body-economy. It has merely been slowly passed through the alimentary tube, being prepared as it went, for absorption into the blood-stream. From the gizzard the "cream-of-food" soup passes into the first portion of the intestine, the duodenum. Here it is intermingled with the bile from the liver and with the pancreatic juice from the pancreas. It then flows on through the jejunum and ileum (the second and third parts of the small intestine) and is gradually exuded through their thin walls directly into the plasma (clear liquid portion) of the blood-stream flowing in the capillaries. Now, at last in the blood itself, it is whisked rapidly around the bird's body. And "whisked rapidly" is no mere figure of speech, either. In the larger game birds the heart-beat is from 100-300 or more times per minute. In the smaller song-birds this rate is increased from 400 beats per minute up to a thousand or more when the bird is under stress of strong excitement.

The absorption of food by birds in general is usually efficient, as may be inferred from the relatively short large intestine and rectum. These hold very little undigested waste material. A pair of small, tubular out-pouchings of the intestine, called the caeca or diverticula, lie in the region where the small intestine merges into the large. In game birds, including ducks and geese, these are well-developed and contain bacteria whose action assists in the breakdown of cellulose material in the food. In our other birds, these caeca are extremely small or even vestigial.

Birds possess two kidneys but no urinary bladder. The clear liquid waste, filtered from the blood by the renal tubules in the kidneys, is slowly drained through two ducts (the ureters) into the cloaca where feces and urine are combined into a soft paste and voided at frequent intervals. In captive birds the condition of the feces affords a valuable index as to the state of health of the bird.

Now, as St. Paul said, "Let us hear the conclusion of the whole matter." "Eating like a bird" means eating a great deal, and eating constantly. So the person who made that remark about Bill at the beginning of this article had better cast about for a better figure of speech.

WORTH READING

Pesticide-Wildlife: 1959, Circular No. 84 of Fish and Wildlife Service, Washington 25, D. C., 36 pages and bibliography of 65 titles. Available at no cost, this is a good summary of research on the relationship of wildlife to insect and other pest control operations.

Start a Gun Club, 25 pages. Available from Sportsmen's Service Bureau, 250 East 43rd Street, New York 17, N. Y. Price: 50c. All you need to know on how to start and operate a gun club.

New Firearms Assembly Handbook—The National Rifle Association of America has just published a new illustrated firearms assembly handbook. Contains exploded-view drawings, parts identification and complete assembly instructions on 77 different rifles, shotguns and handguns. Price: $2.50 postpaid to NRA members; $3.50 to non-members. Write NRA, 1600 Rhode Island Avenue, N.W., Washington 6, D. C.

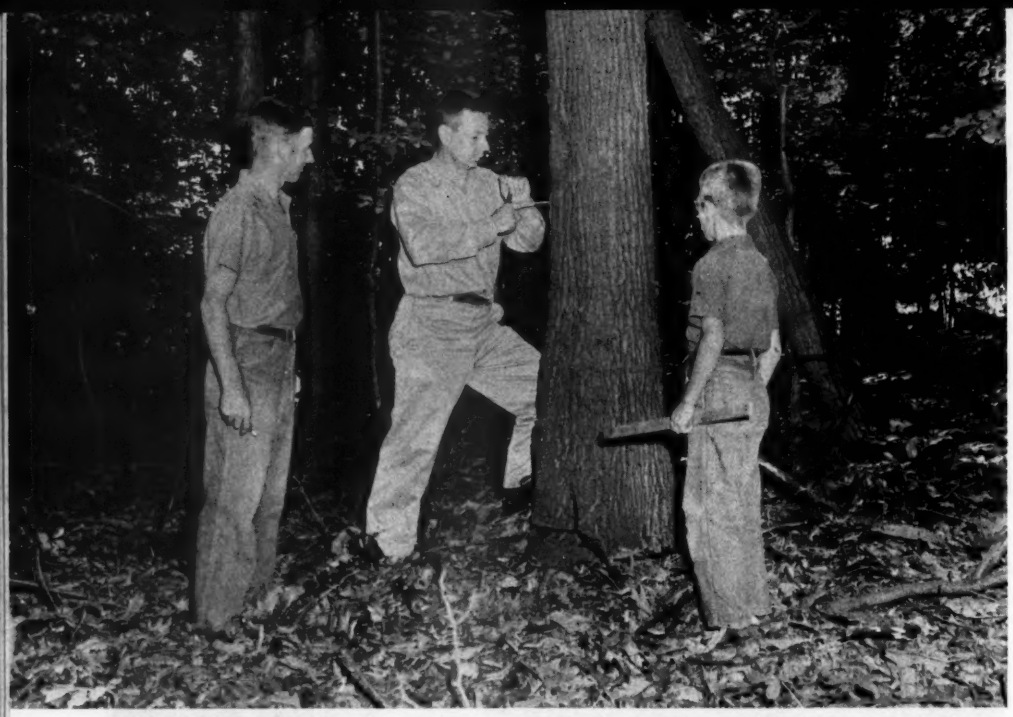
A Tree Farm Program in Southeast Pennsylvania . . .

Glad Hand From Glatfelter

By Robert G. Miller

MENTION pulpwood in the midst of several sportsmen and, depending on what kind of a record they chalked up during the past hunting season, you might find yourself smack in the middle of a hot argument.

Pulpwood is needed in a vital industry today and persons involved must look to their own future welfare, if they intend to remain in business. But it's time we look to the other phase of the business which aids con-



INCREMENT BORING of trees in any woodland can tell a qualified forester whether or not the timber is "ripe" for harvesting. Object of good forest management is to cut trees when they are mature and merchantable.

servation and eventually each and every sportsman.

Not all companies operate on the same plan. Some, perhaps, don't give a darn about the other fellow but there is, right here in Pennsylvania, a pulpwood firm which takes pride in helping the sportsman just as it provides assistance to the farmer and woodlot owner.

The assistance provided by the Glatfelter Pulpwood Co., of Spring Grove, is especially valuable to sports clubs which maintain sports farms, recreation areas with facilities for skeet shooting, fishing, rifle and archery ranges, and perhaps a tract of land set aside as a game refuge.

We are vitally interested in that tract of a few acres set aside for a game refuge, for without proper management it has no more value than a barren back yard.

Proper woodland management, which can also be financially beneficial to the owner without hampering its value conservationwise, is part of the tree farming program through which wildlife is provided more cover and better food. Tree farms act as a sponge to hold water and stabilize the flow of streams, and it is a known fact that proper tree harvesting aids in the growth of deer while proper deer harvesting helps grow a continuous supply of good timber.

Tree farming is a nationwide program sponsored by the forest industries to recognize woodland owners who are making wise use of their property through proper management.

To become a certified tree farmer landowners must harvest their crops in such a manner as to insure repeated crops while, at the same time, they protect the land from fire, insects, diseases and destructive grazing.

The York County firm's program, which covers 14 southeastern Pennsylvania counties, has at its helm D. E. Hess, company vice president and general manager. A professional forester, he also directs similar operations through field offices in Delaware, Maryland and Virginia.

Hal Geiger and Ray Brooks, both

trained foresters, handle on a local basis a well-rounded five-phase program involving: a television series, seedling distribution, technical assistance on woodlot management, opening new small game hunting areas, and literature to educate the property owner and sportsman in conservation.

Possibly the most popular of the five is the television series which can be held responsible for making viewers more and more conservation minded by presenting the facts right in their own living room—showing why conservation is necessary, what will eventually happen without it, and what they can do to aid in its growth.

"Call of the Outdoors," emceed by a veteran sportsman, Harry Alleman, made its debut four years ago. Alleman is entirely responsible for the program and one begins to wonder, since it is a weekly event, when he is going to run out of ideas.

However, he always comes up with something of interest. In addition to hunting, boating or fishing, one week may feature an illustrated, informal discussion on camping; the next week's program may be built around natural history, perhaps Indian folklore or advice from an expert on hunting and fishing in far off places.

What makes this more interesting is the lack of long winded commercials trying to sell something. The few moments that are spent midway during the program are concerned with conservation matters, proper woodland management tips, preventing forest fires, litterbugging or keeping streams clean.

Sports clubs maintaining tracts of woodland are reminded that proper tree farming has a twofold purpose—trees and game. By cutting out trees, not haphazardly, they are establishing an area which will become much more suitable habitat for cottontails, pheasants, quail, wild turkey and even deer.

PLANTING SEEDLINGS is an important part of the Glatfelter tree farm program. Since 1952 the company has distributed more than 5½ million seedlings to cooperators throughout southeastern Pennsylvania. Many are being planted on abandoned farms and lands owned by sportsmen's clubs.

However, foresters advise us, a property is usually marked and cut for a particular purpose. This can be for either one of three purposes: for pulpwood, better ground cover for small game, or browse for deer.

The assistance provided by company foresters originates on a 1,400-acre experimental and demonstrational tree farm in western Adams County. This tract, the first tree farm in Pennsylvania, was established in 1946.

The company practices tree farm management on this plot and what is learned here is passed on to the private woodlot owners throughout the area so they too can properly manage their tracts for whatever purpose they have in mind and without a lot of wasted effort.

Naturally, as the foresters emphasized, their primary interest is guaranteeing a future supply for forest products and even though their knowledge is passed along with this in mind, there are no strings attached. The property owner is not obligated to follow through with their recommendations solely for the purpose of supplying the firm with pulpwood.

So far, perhaps ignorant of the value of this service, few clubs have taken advantage of what this program has to offer. Those that have are gradually improving the forest stand on their properties and building up adequate cover to insure good hunting in the years to come.

Preparing a woodland management plan is dependent on receipt of the following data: property boundaries, acreage, inventory of trees by species, growth rates, degree of stocking and site capabilities. Only after these facts are known can a harvesting schedule be established to determine what will be cut, how much and how frequently.

These facts should be gathered under the supervision of a qualified forester and only after the plan is established should the program be left in the hands of club members to carry out.

Opening private land for public hunting came about in 1959 when the Spring Grove firm, in cooperation with the Pennsylvania Game Commission, provided 2,500 acres of company-owned land in York and Adams Counties for small game hunting. "Welcome Hunter" signs were posted and many hunters, altogether familiar with seeing "No Hunting" signs, were filled with amazement when they came across the former signs for the first time.

Company foresters are also charged with managing a tree planting program through which seedlings, obtained from the state, are distributed free of charge to landowners subject to restrictions imposed by the state; that is, they may not be planted for ornamental use or on a Christmas tree plantation for future sale.

This plan was started about nine years ago. Many seedlings are planted on old abandoned farms. It is interesting to see that same land now covered with abundant hillside cover. Thousands of seedlings are also planted to prevent erosion.

During the first year about 100 thousand seedlings were distributed through this program. Since 1952 and including the 1960 planting season, more than five and one-half million seedlings have been planted throughout the area. Last year alone accounted for more than one and one-quarter million trees.

Many clubs are taking advantage of this offer while the remainder go to landowners in an area extending west to Fulton County, east to Chester County, and Schuylkill, Snyder and Northumberland Counties to the northwest.

Although this description just scratches the surface of the program, it is hoped that more and more sports clubs in south central Pennsylvania will take advantage of what this firm has to offer if they are to promote good hunting as one of the state's major recreational items.

CONSERVATION NEWS

Spring Releases of Game Birds Completed by Commission

The Game Commission has completed its spring release of game birds in Pennsylvania.

Ring-necked pheasants liberated totaled 62,350, of which 28,500 were cocks and 33,850 hens.

Wild turkeys numbering 600 toms and 1,800 hens—total 2,400—also were freed.

Experience has taught that releases made early in the year allow time for the birds to become adjusted to conditions in the open. This procedure results in greater natural production than is the case when game birds are put "on their own" just ahead of nesting time.

State University And Federation Open Junior Conservation Camp

The junior conservation camp which has been sponsored annually by the Pennsylvania Federation of Sportsmen's Clubs will again be in operation this summer, Everett G. Henderson, president of the Federation, and Charles W. Stoddart, director of the camp, have announced. The location of the 1961 camp will be picturesque Stone Valley, which is a short distance from State College.

Each of the Federation's eight divisions will sponsor a group of high school sophomore and junior boys for a two-week period. The first contingent will arrive July 2. The camp will close August 26.

DEDICATION CEREMONIES at the Commission's new Northeast Field Division Headquarters building took place on April 20. Unveiling of bronze plaque at entrance was witnessed by, left to right, Commission members Huffman, Lucas, Long, Miller, Biddle, Buchanan, Hockersmith; Division Supervisor Carl C. Stainbrook; Hon. John Morgan Davis, Lt. Governor of Pennsylvania; and Commission president James A. Thompson.

NEW NORTHEAST FIELD DIVISION HEADQUARTERS was built with funds derived from the sale of oil and gas royalties on State Game Lands. No license fees were used to finance construction of this modern building located at the intersection of Routes 115 and 415 west of Dallas.

Pennsylvania Beaver Trappers Harvest Record Number in '61

During the beaver trapping season this year 5,333 of the large furbearers were caught in Pennsylvania. This represents the highest take of any season except 1934, the first year a season for the flat tails was declared in the Commonwealth, during which 6,456 of the animals were harvested. The limit per trapper was 6 beavers during the five-week season in 1934.

The 1961 season of the same length opened on February 11. At that time record-deep snows clogged roads, foot travel in the open was almost impossible and thick ice over beaver waters combined to discourage activity by most trappers. When the weather broke, late in February, many persons began trap setting in earnest. An added incentive this year was the highest per person limit ever permitted in the Commonwealth—7.

More of the animals were caught in the Game Commission's Northeast Division than in any of the other five. But Crawford County, in the northwest, again accounted for the highest take, 695. The counties next in order were: Wayne with 505—Susquehanna, 404—Erie, 342—Bradford, 307. Other high counties were: Tioga, 283—Sullivan, 277—Luzerne, 229—Clearfield, 210 — Elk, 194 — Wyoming, 186 — McKean, 183 — Lackawanna, 176 — Warren, 168. Beavers taken in Pike County numbered 137, in Monroe 133 and in Lycoming 103.

Beavers trapped elsewhere in the Commonwealth ranged from one in each of the counties of Blair, Northampton, Somerset and York to 92 in Clinton. Interestingly, 84 of the animals were taken in Beaver County in the southwest, where the animals were a rarity but a few years ago.

Highest catches this year were made in counties from which repeated and serious damage complaints have been received. The Game Commission's primary objective in liberalizing the limit this year was to alleviate these conditions.

KNOW YE BY ALL THESE PRESENTS:
THIS CERTIFIES THAT
DID PURCHASE THE ATTACHED
MIGRATORY WATERFOWL STAMP
$3
REDHEAD DUCKS
AS A CONTRIBUTION TO CONSERVATION. THESE DOLLARS GO TO A SPECIAL FUND FOR THE PURCHASE OF WETLANDS AND REFUGES NEEDED TO PRESERVE THESE BIRDS ON OUR AMERICAN SCENE.
SECRETARY OF THE INTERIOR

Sportsmen Urged to Help In Waterfowl Stamp Sales

During National Wildlife Week, Secretary of the Interior Stewart L. Udall launched this year's post-season sale of 1960-61 Migratory Waterfowl Stamps by the Fish and Wildlife Service.

In a ceremony at the Secretary's office members of the fifth grade class from Bunker Hill School in Washington, D. C., bought the first stamp in the special post-season sale, using part of their P.T.A. funds for this purpose. They received a certificate signed by Secretary Udall.

The reward for conservation supporters who make the stamp purchases will be a certificate signed by the Secretary of the Interior, and the satisfaction gained from knowledge that the contributed purchase price is an investment which will pay dividends to posterity. The certificate, which is suitable for framing, has a space on which the stamp may be mounted.

"Both young and old have an opportunity to share in this conservation effort to help preserve the Nation's migratory waterfowl resource for the future," commented Secretary Udall.

"There are two reasons why I approve this program and give it wholehearted support," Secretary Udall said. "First, all America has a stake in our migratory birds. We must establish, while we can, islands of natural habitat and havens where our wildlife can rest and reproduce. We must have funds to buy these lands while the opportunity still exists, and I believe that each and every citizen should have a chance to contribute directly to the cause. Secondly, I know no better way to make our youth conscious of our wonderful country than to give them the chance to share, even if only slightly, in the preservation of its resources.

"There is no better way to fix the eyes of youth on the vistas of tomorrow than to give them an opportunity to take some responsibility today.

"Because I believe that conservation is a program essential to the physical and psychological well being of our people, I have approved this program, not only for its material value, but for the understanding it will generate."

Checks or money orders for these $3 stamps should be sent to the Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, Washington 25, D. C.

13TH ANNUAL FARMER-SPORTSMAN BANQUET sponsored by the Delaware County Field and Stream Asssociation was held at the Blue Goose Inn, WaWa, on March 20. Guests included representatives from state conservation agencies. Jack Meehla, seated center, served as M.C. with Al Bachman, right, of the Game Commission's Division of Land Management, the principal speaker.

Commission Rabbit Trappers Transplant 52,000 Cottontails

Approximately 52,000 cottontails were live-trapped in Pennsylvania during the Game Commission's month-long trapping and transfer program early this year. Snow storms and extreme cold during the trapping period reduced the take in some areas.

This operation is conducted annually to remove rabbits from garden, park, cemetery and nursery properties where they have been reported causing damage. Cottontails are easier to bait into traps during food-scarce winter months than they are during periods when green vegetation is available.

Rabbits captured under this program are transported to open hunting territory and liberated.

Recent-year totals of cottontails caught and released in Pennsylvania under this program follow: 1960—53,070; 1959—43,921; 1958—55,861; and 1957—56,642.

Game managers in the Commonwealth have observed that when cottontails were plentiful during a hunting season they were numerous in towns also. Conversely, when the rabbit population has been "down" in shooting territory there has been a comparable decrease in the number of "city" rabbits.

JUST A LITTLE LITTER

According to "Keep America Beautiful, Inc.," over $50,000,000 in tax funds are spent each year to remove litter from primary highways. "Last year, the U. S. Forest Service budgeted $3,000,000 just to clean up litter from our national forests," KAB says. The cost of litter-caused fires throughout the country is more than $70,000,000 annually. Human losses also are great. "Between 750 and 1,000 Americans are needlessly killed and 100,000 seriously injured each year as a result of cars striking or swerving to avoid hitting objects thoughtlessly thrown on our highways," KAB concludes.

USDA Announces Program to Improve Hunting and Fishing in Forests

Sportsmen can look forward to better hunting and fishing in the National Forests during the next 10 to 15 years because of a wildlife habitat management program announced recently by the U. S. Department of Agriculture. This plan, called *National Forest Wildlife,* is part 2 of Operation Outdoors.

"In this atomic age of specialization and mounting pressures, periods of rest and relaxation have become tremendously important to the welfare of the American people," Secretary of Agriculture Orville L. Freeman said.

"More and more people visit the National Forests to relax with rod and gun. Forest Service records show nearly a 200 per cent increase in sportsman visits during the past 10 years. Some 23 million visits are made annually by hunters and fishermen."

Operation Outdoors is a more detailed presentation of the wildlife phase of the program for the National Forests already approved by Congress and commonly known as Operation Multiple Purpose. It is designed to improve fish and game conditions and meet the growing public needs. Planning of improvements for each area will be carried out in cooperation with the state fish and game departments.

Highlights of the program include: Planting shrubs, grasses and herbaceous plants on 1.5 million acres of game range; clearing openings, food patches, and game ways for wildlife in dense vegetation on 400,000 acres; and improvement of 7,000 miles of fishing streams and 56,000 acres of lakes by stabilizing banks, planting streamside cover, and constructing channel improvements. The cost of improvements is estimated at $25.6 million over a 10- to 15-year period.

BLAIR COUNTY Game, Fish and Forestry Association held their annual farmer-sportsman banquet recently. A few of the nearly 100 persons attending included, left to right: Front row—Walter Keller, Sinking Valley; William Tully, chairman of the dinner committee; Bill McCarty, TV and radio speaker; George Shope, Association president; Hon. Charles A. Auker, member of the Pennsylvania Legislature. Back row—Clair Fisher, Warriors Mark; Robert Bagshaw, Scotch Valley; Ralph Kutruff, Riggles Gap; Judge John M. Klepser; and Ernest Albright, Sinking Valley.

A General Look at Scopes and Binoculars for Outdoor Recreation...

Glassware for Sportsmen

By Jim Varner

WITHIN one short article, it is impossible to cover much detail on a subject of wide scope. But with June bustin' out all over, varmint hunting at its best, and a lot to see outdoors, most sportsmen are talking and thinking about binoculars, spotting scopes, rifle scopes and telescopic sights for precision shooting at all ranges. We will try to hit the highlights of this interesting subject, giving personal opinions and experiences that range back to the old telescopic rifle sights which were long, complicated affairs with very narrow fields such as the three- or four-foot Bardou 35X spotting scope. Although we will discuss briefly most types of glassware currently available to sportsmen, we will try to keep the rifleman first in mind.

A few years ago we depended upon binoculars made in Europe for the best money could buy. American field glasses and binoculars were not considered to be anywhere near equal to the German Zeiss, Hensoldt, Voight-

lander, Busch and others. Some even considered the French binoculars better, while the British-made Taylor, Hobson & Cooks products ranked tops as well. I clearly remember the sense of pride and superiority the long-range rifleman had when he adjusted his old three-foot long Bardou spotting scope on the thousand-yard target during the matches at Sea Girt, Camp Dodge and Camp Perry. It was a clumsy instrument with a small field of view. It magnified 33 times and you could watch the mirage (heat waves) flowing and dancing between your firing point and the big target well over a half mile away. Many of the shooters were experts at judging windage changes from shot to shot because of the tremendous power of this scope. To own one was an honor that gave the shooter considerable prestige.

We've come a long ways in the past 50 years in the development of all types of "magic eyes" for sportsmen and riflemen. American manufacturers no longer take a back seat when their product is compared with the best in the world, a superiority which has been especially noticeable since World War II. You can buy American-made telescopic sights, spotting scopes or binoculars today with confidence.

Henry Ford is generally credited as being the first man to put a good, reliable auto within the reach of the average citizen. I would pin the same laurels on my good friend Bill Weaver, of El Paso, Texas, for making ownership of rifle telescopes possible for the great mass of average riflemen. We were down in his plant several years ago when he was engineering the final touches on the K8 and K10 scopes for varmint and target shooters. If any of you happen to be down in his neighborhood, drop in and see this fine plant. It has turned out hundreds of thousands of scopes, ranging all the way from the 1X shotgun scope to the newest 2½-8X variable.

Other American-made hunting rifle scopes are produced by Bausch and Lomb in magnifications from the 2½ Baltur to the famous Balvar 2½ to 8 variable. All of the Bausch and Lomb products are equal to or better than similar products regardless of where they are made. Their spotting scope is made in 15, 20, 30 and 60 power. They also have a Balscope, Jr., in 20 power which is very efficient on target work up to 200 yards. Binoculars made by this firm are high in price but worth every cent for the particular sportsman.

Unertl's varmint scopes and fine target scopes are popular wherever sportsmen meet. Their two-inch target scope seems to be the choice of many benchrest shooters throughout the country in 20X and 24X powers. Being first choice with this group of precision shooters is an honor one cannot overlook. Although Unertl doesn't make binoculars, they do manufacture three precision spotting scopes, one with a convenient right angle eyepiece.

Other high grade spotting scopes ranging above $50 in price and prismatically designed are the Bushnell Sentry and Spacemaster, the Saturn Scout, and Swift's Model 821 in 15-60X, along with United's scopes with 45 and 60 mm objective lens. The less expensive 20X Saturn and Mossberg drawtube scopes make fine glasses for the beginner. They possess the 20 power magnification of the higher priced prismatic scopes but lack brilliancy under poor light conditions.

Good stands for all spotting scopes are an absolutely essential accessory. While discussing these powerful spotting scopes, you should also keep in mind the fact that they make the finest, long-range bird or animal spotting scopes, providing you carry a sturdy yet light tripod which can be adjusted to any height for comfortable viewing. A scope that will show 30 caliber bullet holes in the black at 200 yards or more will make a bobolink look like a black turkey vulture at 250 yards. Such an outfit can add many interesting hours of pleasure to your outdoor

ONE OF THE FIRST variable scopes was this Zeiss Zielmultar (1 to 6X) mounted on a star-gauged national match Springfield "C" type stock. Rifle below is a 30-40 Krag with a 54 Winchester barrel chambered to fit the Krag receiver. One of Bill Weaver's early K-4 sights is mounted on the inexpensive side mount.

experiences, whether you are watching birds or checking woodchuck dens.

Next to the spotting scope in importance is the long, sliding tube target scope with a comparatively narrow field of view. The Lyman Gun Sight Company in addition to the others mentioned above, produces some of the best target scopes available in magnification up to 30X. These are called the Lyman Super-Targetspots. I have used a 15X Super-Targetspot for many years on everything from a Winchester heavy barrel 30-06 to the Remington and have always found it very reliable.

For the man who has target-stocked, heavy-barrelled, precision varmint and range rifle, there is no use in investing money in any of the target scopes under ten power. Personally, I prefer 15X to 24X in order to get the most out of super-accurate cartridges. Such scopes as the 20X Super-Targetspot, Unertl's 20X and above, as well as the tremendous 6X to 24X Balvar variable are capable of bisecting a woodchuck's eye at 200 yards or more. It's up to you to learn how to use these precision outfits and to do your best at choosing the cartridge capable of doing justice to such heavy equipment.

It's impossible for me to recommend the best caliber, the best rifle, or the correct powered scope for your individual shooting, range work and big game hunting. To do so would create a flood of mail to my "igloo" that would compare favorably with last winter's snowfall. By the same token, I will not attempt to tell the birdwatcher, the woodchuck hunter or the tourist which binocular he should put in his equipment case. There is such a variety of hunting scopes and mounts available on the market today that I cannot recommend any single product. What might be ideal for a "five by five" individual may be all wrong for the tall guy who describes himself as six-two in height, hatchet faced, weighing 150 pounds, and looking like a blue heron with snowshoes, as one of my unusually interesting "fans" de-

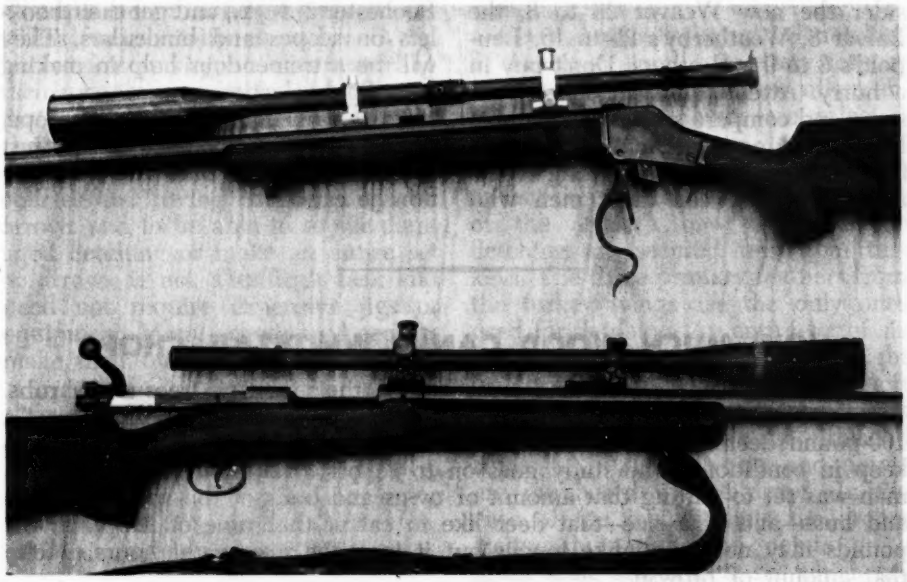
scribed his physical make-up in a recent letter.

Actually, though, there is only one heavy-barrel varmint and target rifle made in the U. S. today. That's the Model 70 Winchester. Both target and varmint types are made in 243 caliber, while the varmint model is also made in 220 Swift and the target model in 30-06 and 300 H&H magnum. I understand, however, that Remington will soon be making the heavy barrel jobs in 244, 270 and 280 calibers. Some fine foreign made heavy barrel outfits, including the Sako, are on the market in 222 Remington, 243 Winchester, 244 Remington and other calibers. Properly hand-loaded, these all qualify for the fellow who is willing to tote a heavy load. Add a pair of 7x35, 8x40, or 10 x 50 binoculars for viewing convenience to this precision equipment and you have real varmint hunting.

Excellent results are possible with all 22 caliber rifles made today and grooved to take the inexpensive, tip-off mount originated by Weaver and suitable for ¾-inch, low-priced 2½, 4 and 6X telescopes. Recently Weaver has been making a mount that will handle the better one-inch scopes on these tipoff bases. Scopes range from the 1X Weaver to the 2½-12 variables in prices ranging from $15 to $135 or more. Practically all of them are satisfactory. Mounts will cost you from $2 to $35. Some of these mounts have remained unchanged for over 30 years, a fact which speaks well for their sound construction. I have a Griffin and Howe special mount on a National Match Springfield which carries the huge, old Zeiss Zielmultar scope (1 to 6) variable that has been in continuous use since the late 1920's. Its construction is so strong that the zero is unchangeable unless I go to a different load combination.

Some riflemen prefer 2½ to 4X scopes with a good field of view for big game hunting. For normal distances and average game loads these

TARGET SCOPES in the author's collection include a Fecker 10X, 1⅛ objective lens with hi-power eyepiece which brings it up to about 14X. It's mounted on a Hi-wall Winchester with Buehmiller barrel chambered by Griffin & Howe for the 219 Zipper. Below is the 15X Lyman Super-Targetspot on a Winchester 30-06 Bull Gun. Neither of these rifles leaves room for alibis.



INEXPENSIVE TELESCOPIC SIGHTS for rifles grooved for them cost as little as $7.50. They are made in powers from 2½X to 6X. This is a Colt 6X mounted on a Mossberg 22 Magnum rifle.

are fine. But for the experienced shooter using long-range equipment like the 270, 30-06, 300 H&H and the real hot numbers like Winchester's 264, 338 and all of Weatherby's Magnums, the preference should be for the latest variables. You should consider the new Weaver 2½ to 8, the Balvar 8, Weatherby's 2½ to 10, Leupold's 3 to 9 and others. Don't buy in a hurry. Attend different shoots, observe and compare scopes and mounts before making your final choice. National Rifle Association shooting events are where you can meet men who know and will advise you correctly. Join the N.R.A. and get the "American Rifleman" magazine. It will keep you up-to-date on everything that is new in the shooting game, as well as older equipment. You should also write to Bausch and Lomb Optical Company, Rochester 2, N. Y., and get their booklets on scopes and binoculars. They will be a tremendous help in making your final selection.

To the rifleman, a good rifle scope, spotting glass and binoculars are just as essential as the rifle and ammunition he carries.

HOW MUCH WOOD CAN A WHITETAIL CHOP?

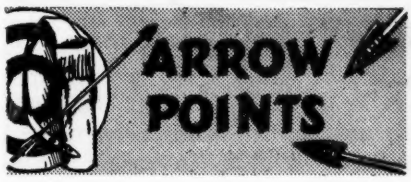
Deer have no upper teeth and must "worry" their food off trees and shrubs. Yet, the New York State CONSERVATIONIST, in a recent article, notes: "a 100-pound deer requires about six pounds a day of good quality browse to keep in condition." The study goes on to report, "that as an experiment, a man was set to cutting that amount of twigs and buds of the species of tree and bush—and of a size—that deer like to eat at that time of the year. Six pounds may not sound like much; but it took the man eight hours to clip that amount of browse."

Arrow Making Can Be An Enjoyable Hobby...

Tackle Dividends

By Tom Forbes

FIRST quality archery tackle can make a dent in the pocketbook and it has forced many an archer to try his hand at making his own tackle. To their surprise many archers have found that they enjoy the hobby and that they can produce first quality tackle at a considerable saving in cost. Field courses and roving can be rough on arrows and to be able to repair damaged fletching or make an entire set of arrows is not a difficult task and need not require expensive jigs or equipment. Many experienced archers make their own arrows and work to tolerances lower than those set by the manufacturers.



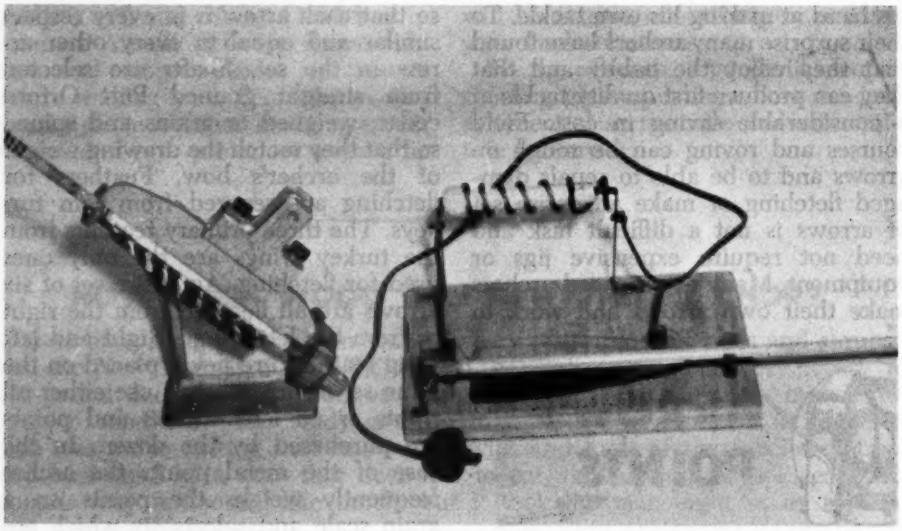
A set of arrows should be matched so that each arrow is in every respect similar and equal to every other arrow in the set. Shafts are selected from straight grained Port Orford cedar, weighed to grains and spined so that they match the drawing weight of the archer's bow. Feathers for fletching are secured from tom turkeys. The three primary feathers from the turkey wings are the only ones used for fletching. An entire set of six arrows are all fletched from the right or from the left wings. Right and left wing feathers are never placed on the same set of arrows. You use either all rights or all lefts. Nocks and points are purchased by the dozen. In the case of the metal points the archer frequently weighs the points on a grain scale and selects six which are

equal in weight. This in general is how the experienced archer does precision work when he makes his own arrows.

The beginner will have purchased his first set of arrows with his initial purchase of equipment. After he has shot for a period of time, lost some arrows and broken others, he will begin to consider whether he can make his own replacements. Inquiry among his fellow bowmen will put him in touch with the ones who are making their own arrows. From them he can learn the source of the necessary materials he will have to purchase and he may be invited to visit the home of the archer and observe the process of arrow manufacture. If so he would do well to take advantage of the offer as he will more easily learn the technique and avoid the trial and error method by attempting to do the job without any preliminary instruction. However, if you have to tackle the job without any previous instruction, rest assured that it is not a difficult task and that you can master it with patience and very soon acquire considerable ability.

An individual who does not wish to mass produce arrows needs only simple inexpensive equipment. A fletching tool that will fletch three feathers at the same time may be purchased for $2. This machine will fletch a feather 5½ inches long. A feather burning kit which you can assemble is priced at $2.75. A sporting goods store which handles a complete line of archery tackle will carry shafts of Port Orford cedar of number 1 grade. You may purchase a dozen of these shafts already spined for the weight of your bow for approximately $2 for 5/16 inch diameter shafts and $2.25 for shafts of 11/32 inch diameter. Three dozen feathers which are enough to fletch one dozen arrows either right or left wing, with the quill split and a smooth base ground ready to apply to the shaft will cost you from $1.75 to $2.65 according to the color. For example, natural gray bar are priced at $1.75 and all white $2.65. Target points sell for 75c, field points 85c, and hunting heads around $4 per dozen. Plastic nocks are 45c per dozen. Simple arithmetic will show you that the materials sufficient for one arrow will cost at retail prices

ARROW MAKING EQUIPMENT is inexpensive and is not difficult to use. The fletching tool, left, handles three feathers at the same time; the feather burning kit, right, is easily assembled.



about 32c for a target arrow and 60c for a hunting shaft. Contrast these prices with the cost at retail of arrows of similar quality. You will find that the price ranges from $9 for unmatched practice arrows to $15 for top quality arrows fitted with target or field points; equipped with hunting heads you can pay up to $20 per dozen. One additional item of equipment to shape the ends of the shafts for the points and nocks is needed. This is called a taper and tenon tool and can be purchased at retail for $1.50.

Assuming that you have purchased the items and materials indicated let us outline briefly the procedure required to make an arrow. Shafts are furnished in 30-inch lengths and a close examination will reveal that the ends are generally imperfect. Cut off one end so as to remove the damaged section. The taper cutter will cut either a 11-degree taper or a 5-degree taper. The 11-degree taper should be used to cut the nock taper on the end of the shaft. Duco household cement is satisfactory for gluing the various components to the shaft. Place a small quantity of the cement in the nock and set it in place with a circular motion on the end of the shaft. The nock should come to rest at right angles to the grain of the shaft. Measure the required length of the shaft by placing it alongside of one of your arrows. Mark a point on the new shaft at the shoulder of the metal point, allow an additional ⅛ inch and cut the new shaft at this point. With the 11-degree taper portion of your tool cut the taper. Place the point temporarily in position and compare the total length with your old arrow. Cut and try with the taper tool until the arrows are the same length. Lay the new point aside and with steel wool or fine sandpaper rub down the new shaft lightly. Wipe clean with a dry cloth and brush with a coat of clear lacquer or varnish. Hang vertically by the nock until perfectly dry. Sand lightly once more and apply a second coat.

You may lacquer several shafts at the same time. To do this lay a sheet of waxed paper on your work bench and then place the shafts side by side on the paper. Brush the lacquer on all the shafts at the same time, holding them in position and rolling them back and forth with your free hand. The housekeeper's spring jaw clothes line clips can be snapped onto the nock and used to hang the shafts on a convenient line. One type of this pin is equipped with a wire hook to hang the pin on the line.

The finished fletch on a field arrow averages 5 inches in length. Examine your supply of feathers and reject those that show a rippled surface or appear soft or flabby to the touch. An occasional one may slip past the inspector in a batch of first quality feathers. Cut from the same portion of each feather the exact length of fletch desired, measuring from the tip toward the butt of the feather. Stand the feather on its base and with a sharp pocket knife cut through the base at right angles to the longitudinal length of the feather in line with the vanes of the feather. Measure a distance of one inch from the bottom of the nock and mark this point on the shaft of the arrow. Now insert the nock end of the shaft into the fletcher and revolve the shaft until the index on the nock is up or if there is no index on your nocks, until the nock is in a vertical position. Adjust your cut feather in the clamp so that the butt of the feather will coincide with the mark on the shaft. When you have determined this position place a mark on the clamp which will enable you to place the succeeding feathers in the correct position in the clamp. Leave the base of the feather project about 1/16 inch from the base of the clamp. This will prevent cementing the quill to the metal base of the clamp. With the feather in the correct position in your clamp apply a thin

FINISHED FLETCH on a field arrow averages 5 inches in length. Examine all feathers and reject those that show a rippled surface or appear soft to the touch.

coating of "Duco Household Cement" to the base of the quill and take a drop on your finger and rub it on the portion of the shaft to which the feather will be attached. Now set the clamp firmly in position on the shaft. Allow about ten or fifteen minutes for the glue to set before you attempt to remove the clamp. If any cement has adhered to the base of the jaws scrape it off before you insert your next feather. Some fletchers will fletch all three feathers at the same time and others fletch one feather at a time.

Every feather has a natural spiral. However the standard clamp of the fletching jig has a straight base. It is generally conceded that a shaft which revolves in flight will fly toward the target more accurately than one that does not revolve. Therefore it is to your advantage to buy a fletcher which will have a spiral base. With these fletchers the feather is fixed to the shaft with a slight spiral and the wind acting on the fletch as the arrow moves toward the target will cause the arrow to rotate. In commercial fletching a battery of fletchers is used and the operation is continuous. For the individual who has but one jig, time must be allowed for the cement to dry before the shaft is removed from the jig. Once your setup is in position a few minutes' work at convenient intervals will perform one complete operation.

If your nocks have an index on them which allows you to determine the position of the nock by feel you need not be concerned with making the cock feather of a distinctive color. However, if there is no index, then a colored cock feather will be an advantage in nocking your arrow. The cock feather is the one placed on the shaft directly in line with the longitudinal center of the nock. In nocking your arrow you revolve the shaft until the cock feather comes into the same plane as the bowstring and then the string will enter the nock.

When all of your shafts have been fletched you are ready to trim the feathers to the final shape. The use of a feather trimmer will be described in the following issue.

BIOLOGICAL CONTROL OF PLANT PESTS

Biological control of plant pests, which is not to be confused with chemical spraying, involves the use of natural materials—predaceous insects against a harmful species, sterilization of males, diseases, and other means—in the control of undesirable insects, the Wildlife Management Institute reports. Although slower acting and not nearly so spectacular as applications of powerful poisons, biological control has the comfortable assurance of being effective, selective rather than lethal to all good and bad insects alike, and better understood as to its effects on man, livestock, and animals.

An excellent discussion of this subject is the "Handbook on Biological Control of Plant Pests," published by the Brooklyn Botanic Garden. The illustrated 97-page booklet is a compilation of 16 articles by qualified experts on various aspects of biological control. Copies may be obtained from the BBG, 1000 Washington Avenue, Brooklyn 25, N. Y., at $1.00 apiece.

Soil + Plants = Wildlife

(Part I)

By Ted S. Pettit

IT DOESN'T take much thinking for any of us to realize how important soil and water resources are to us as human beings. Think, for example, of your own diet for a day or a week.

It probably includes bread, cereal, fruit, vegetables—all from plants of one kind or another. It includes eggs, meat, milk, cheese or ice cream, all products of animals that live on plant life. The leather, wool or cotton in your clothing comes from animals that eat plants – or directly from plants themselves. The wood products in your home, even the coal and oil that heat your home originated as living, growing plants. And all of these plants grew in good soil with the help of water.

Wild animals, too, depend upon plants for their life. Some of them, such as deer, rabbits, squirrels, quail, sparrows, pheasants or deermice, eat buds, bark, grasses or seeds, all produced by plants. Others, such as bears, foxes, woodpeckers, snakes, hawks, owls, trout or bass, eat smaller animals that live on plant life. You can trace the food chain of any animal back to plants and the soil in which the plants grew.

Many wild animals depend upon plant life also for shelter from their enemies or for places to build their nests or dens. Squirrels may build a nest high in an oak tree with warblers or woodpeckers as their neighbors. Rabbits may seek shelter in a tangle of cat brier or blackberries where a brown thrasher, catbird or mockingbird has its nest. Bluegill sunfish may flee from a hungry bass and find shel-

SHELTER AND HOMES are provided by plants to wildlife. This flying squirrel occupies a natural cavity in a tree for his homesite.

ter in underwater weeds where minnows also hide and feed.

All animal life depends upon plant life, and for one very good reason—plants do something that animals cannot do for themselves. Green plants are the only living things that can change air and water into a form of food that animals need.

In a sense, green plants—from some so small that you cannot see them without a microscope to huge sequoias a thousand years old – are factories that manufacture sugar and starch, using sunlight as power and air and water as raw materials. Sugar is a basic food, and from it plants and animals produce other food substances, such as proteins, starches, oils, fats and vitamins. All foods, then, originate in the leaves of green plants.

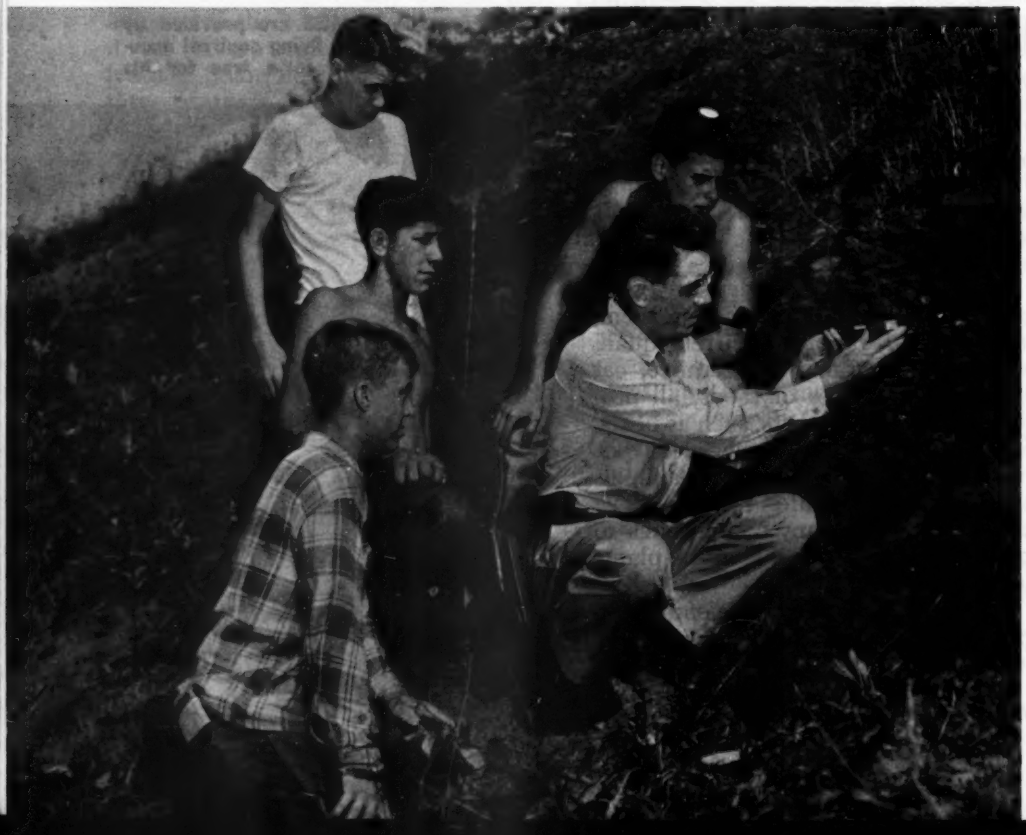
Since plants are so important to animal life, generally the kind of plants that grow in an area will determine to a large extent which animals will live in that area.

It has taken the earth millions of years to develop into what it is today. In that time, plants have become adapted to living in certain kinds of places. They have developed individual requirements and grow best only where the conditions exist to which they have become adapted.

This is the reason why the trees and shrubs of eastern United States are different from those that grow naturally on the prairies; and why the plants that grow in the dry, hot deserts cannot grow in a swamp or marsh. It is basic reason behind the fact that there are different natural communities in different parts of the country. But what are those things that determine which plants will grow in any given area?

Generally, there are three main reasons why plants grow where they do—

SOIL PROFILE may be seen along many banks or cuts in the earth's surface. A typical profile may show three distinct layers—surface soil, sub-soil, and the material from which the two top layers have been formed.



climate, water and soil. First let's look at soil, what it is, where it comes from, and how it affects plant growth.

Soil

The soil that covers the earth has been compared to the rind of an orange—it is much like a "rind" on the earth. But this rind on the earth is different from that on an orange because it is not the same thickness all the way around, nor is it always the same color. In some places such as on mountain tops or slopes soils are thin, while in other places such as river bottom land, the soil is deep. Soil may be red, yellow, brown, black, or gray in color. But whatever its color, it lies between the molten rock core of the earth and the life that exists on land and in the water areas of the earth. It is soil that makes life on earth possible.

There are different kinds of topsoil, but generally they have a few things in common. They usually consist of mineral matter and decayed plant and animal life; they all have some degree of water and air in their make-up.

Every soil too, is a succession of layers one under the other, from the surface down to rock. By studying these layers, scientists can read a story that may be millions of years old, for as soil is formed it records the geologic history and the climate of the area. You may see these layers by carefully digging a hole three or four feet deep, or by looking at the edge of a hole already dug. Excavations for house foundations or road cuts often reveal layers of soil. These layers when observed in this way are called a "soil profile."

As you look at a typical profile, what you see may be three distinct layers. The top layer, or surface soil, is the part in which the most life exists—plant roots and small animals. This topsoil layer contains more decayed plant and animal matter than the layers beneath it and may be darker in color.

In areas of high rainfall, water falls on this layer first and soaks through to the layers beneath. Many of the minerals that once were found in the topsoil have been washed down into the second layer. This does not happen in low rainfall areas such as deserts.

If you were to pick up a handful of soil from this top layer, you would find it different from the next layer. It would probably be less moist, more crumbly, and have an entirely different texture. It may also differ in color from the second layer.

What you find in the second layer depends upon the history of that soil. The second layer may be what is called "sub-soil," or it may be what is called "parent material," depending upon several things. But if you can see three distinct layers, the chances are good that what you see in the second layer is "sub-soil." This sub-soil has fewer living plants and animals than the layer above, but more than the layer beneath. It will probably have more minerals in it than the top layer and in color may be between the top layer and the layer beneath. It may be harder when dry than the top layer, and stickier when wet.

The third layer down is the deepest of all. The layers above may be from an inch or two to a foot or more thick. But this third layer, which may be solid rock or broken up and decayed rock, can be many feet thick. This third layer is the material from which the two top layers have been formed. this third layer usually is lighter in color than the other two.

Climate

We all know of plants that grow in some places and will not grow in others because of temperature. Palm trees, live oaks and some cacti grow naturally only where temperatures are warm all year round. Fir trees on the other hand, spruces and aspen cannot grow in those places because the temperature is too high for most of the year. They require cold winters.

Temperature, wind, and rainfall (or

snow) over a period of time are called "climate." In the same way that plants have soil requirements, they also have requirements of climate—temperature range from hot to cold, and the amount of water that falls on the earth each year over a period of time.

The central part of the United States and Canada is composed of what we call grasslands of prairie. But the prairie in the eastern part is different from that near the slopes of the Rocky Mountains. One main reason is the amount of the rainfall.

In other places though, there is more moisture, and trees thrive and grow as large forests. Grasses can grow here too, but in nature they cannot compete with trees. Grasses need direct sunlight to grow. Most of them cannot grow well in the shade. Where trees find conditions suited to their needs, they will take over and drive out the grasses.

Things to Do

Make Some Soil Artificially—Rub two pieces of limestone or fine sandstone together. If you do not have natural stone, pieces of building bricks or concrete will do. Notice how long it takes to rub off even a few fine particles.

Heat a small piece of limestone over a flame or on a hot plate. Drop it quickly into a pan of ice water. The rock should break or crack as it contracts after its expansion by heating.

Fill a small discarded glass jar with water and cap it tightly. Let it freeze outdoors or in the freezing compartment of a refrigerator. Note what happens to the jar.

Put some small pieces of limestone in a little vinegar. Heat the vinegar on a hot plate or over a burner and notice how bubbles form on the pieces of stone. These bubbles are carbon dioxide gas made from carbon and oxygen released from the limestone by a chemical change in the rock caused by the acid in the vinegar. If you continued this process long enough, all the limestone would gradually break down.

Compare Soils

Fill flowerpots with soil from the following places: (1) Topsoil from an old fence row or from a pasture that has never been plowed; (2) soil from an eroded hillside; (3) sub-soil from a depth of 3 to 4 feet, which may be taken from a roadbank where the different layers of soil can be easily distinguished; (4) another sample or two of different soils in your community, for example, from an old lake bed or a woodland.

If you live in the city, take samples from a flower bed, from an excavation for a building, and from an eroded roadbank.

Plant a few beans in each pot—3 or 4 will be plenty. (Soaking the beans overnight in water hastens germination.) Keep the pots watered and place them where they will be warm and have some sunshine. At the same time plant 3 or 4 beans in cotton and keep moist.

Compare the rate of growth. Keep a record of how fast the beans in each pot grow and how each plant looks. Compare these plants with the ones grown in cotton.

PHOTO CREDITS

P. 9 & 12—"Hoagy's," Canton, Pa.
P. 10 & 11—Mrs. Leon J. Keagle, Canton, Pa.
P. 13—PGC by Delbert Batcheler
P. 15—Leonard Lee Rue, III
P. 16—Lynwood M. Chace
P. 24—R. G. MacLeod, Stroudsburg, Pa.
P. 32, 34 & 35—PGC by John Sedam
P. 33—Courtesy Altoona "Mirror"
P. 36—Leonard Lee Rue, III
P. 37 & 38—PGC
P. 39—Crawford Greenawalt
P. 41—Donald S. Heintzelman
P. 43, 44 & 45—Glatfelter Pulpwood Co.
P. 47 & 48—PGC by John Behel
P. 50—Edward R. Levy
P. 51—Courtesy Altoona "Mirror"
P. 52, 54, 55 & 56—Jim Varner
P. 57—Ford News Bureau
P. 58 & 60—Tom Forbes
P. 61—Leonard Lee Rue, III
P. 62—Hal H. Harrison

PENNSYLVANIA GAME COMMISSION DIRECTORY

M. J. GOLDEN ..... *Executive Director*
GLENN L. BOWERS ..... *Deputy Executive Director*
PAUL J. SAUER ..... *Comptroller*

Division of Administration

ROBERT S. LICHTENBERGER ..... *Chief*

Division of Research

HARVEY A. ROBERTS ..... *Chief*

Division of Land Management

C. C. FREEBURN ..... *Chief*

Division of Law Enforcement

THOS. F. BELL ..... *Chief*

Division of Minerals

JOHN B. SEDAM ..... *Chief*

Division of Propagation

RALPH E. BRITT ..... *Chief*

FIELD DIVISIONS

SOUTHEAST DIVISION—M. D. Stewart, Supervisor, 1009 N. Eighth St., Reading. Phone: FRanklin 4-2661
Berks, Bucks, Chester, Dauphin, Delaware, Lancaster, Lebanon, Lehigh, Montgomery, Northampton, Philadelphia, Schuylkill, York.

NORTHEAST DIVISION—C. C. Stainbrook, Supervisor, Box 218, Dallas. Phone: ORchard 5-1122
Bradford, Carbon, Columbia, Lackawanna, Luzerne, Monroe, Montour, Northumberland, Pike, Sullivan, Susquehanna, Wayne, Wyoming.

NORTHCENTRAL DIVISION—LeRoy Gleason, Supervisor, Avis (R. D. 1, Lock Haven). Phone: Aris 753-3404
Cameron, Centre, Clearfield, Clinton, Elk, Lycoming, McKean, Potter, Tioga, Union.

SOUTHCENTRAL DIVISION—James A. Brown, Supervisor, 327 Penn St., Huntingdon. Phone: MItchel 3-1831
Adams, Bedford, Blair, Cumberland, Franklin, Fulton, Huntingdon, Juniata, Mifflin, Perry, Snyder.

NORTHWEST DIVISION—T. A. Reynolds, Supervisor, 422 13th St., Franklin. Phone: IDlewood 2-5610
Butler, Clarion, Crawford, Erie, Forest, Jefferson, Lawrence, Mercer, Venango, Warren.

SOUTHWEST DIVISION—G. L. Norris, Supervisor, 339 W. Main St., Ligonier. Phone: BEverly 8-9519
Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington, Westmoreland.

GAME FARMS

EASTERN GAME FARM—Joseph L. Budd, Superintendent, R. D. 1, Schwenksville. Phone: ATlas 7-2351

WESTERN GAME FARM—Jack N. Anderson, Superintendent, R. D. 1, Cambridge Springs. Phone: 3707

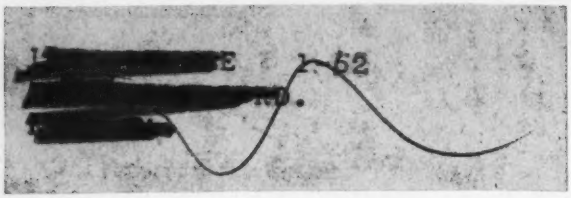
LOYALSOCK GAME FARM—Charles Pfeiffer, Superintendent, R. D. 2, Montoursville. Phone: Loyalsock 435-2500

STATE WILD TURKEY FARM—Leon P. Keiser, Superintendent, Proctor Star Route, Williamsport. Phone: Loyalsock 478-2252

SOUTHWEST GAME FARM—Clarence Wilkinson, Superintendent, Box 1, Distant. Phone: New Bethlehem—BRoadway 5-7640

HOWARD NURSERY

SUPERINTENDENT—George Weller, R. D. 2, Howard. Phone: Bellefonte—ELgin 5-6171



for 12 big issues of Games News . . . each one jam-packed with the sort of entertainment, information and assorted facts that are important to hunters and of value to everyone.

More and more sportsmen are learning that a green federal issue buck invested in Game News is a big help in bagging the four legged variety in Penn's Woods.

Make sure you and your friends don't miss Game News (or a deer) . . . send $1 for 1 year . . . $2.50 for 3 years with the name and addresses for each subscription to

Game News
Pennsylvania Game Commission
Harrisburg, Pa.